SUBSCRIPTIONS FOR 1935 NOW PAYABLE

Detachable Subscription Blank in this Number

ENTOMOLOGICAL NEWS

DECEMBER. 1934

Vol. XLV No. 10

HARRISON GRAY DYAR,
1866-1929.

CONTENTS

Cresson—Notes on a New Manual of North American Diptera, Comments and Criticisms 259
Smith—Dates on which the Immature or Mature Sexual Phases of Ants have been Observed (Hymen.: Formicoidea) 264
Applied Entomology in Public Health 267
Cartwright—A List of Scarabaeidae Collected at Clemson College, South Carolina (Coleoptera) 268
Hinton—New Species of Terapus from North America (Histeridae, Coleoptera) 270
Bradley—The Status of the Genus Rhinopsis, with Description of a New Species from Texas (Hymen.: Ampulicidae) 273
Townsend—A New Genus of Cobboldiini and a New Genus of Chrysomyine Flies (Diptera: Oestridae, Muscoidea) 277
Hinton—A New Name for Aphodium smithi Brown (Coleoptera, Scarabaeidae) 277
Stutzman—Some Observations on Notonecta undulata Say (Hemiptera: Notonectidae) and other Aquatic Insects in Winter- . . . 278
Entomological Literature 281
Obituary—Dr. Francis Metcalf Root 285
Obituary—Dr. Frederic W. Goding 286

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES,
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1.
Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS

published monthly, excepting August and September, by The American Entomological Society.

Philip P. Calvert, Ph.D., Editor; E. T. Cresson, Jr., R. G. Schmieder, Ph.D., Associate Editors.

Advisory Committee: Philip Laurent, J. A. G. Rehn, Chas. Liebeck, J. Chester Bradley, Ph.D., Frank Morton Jones, Sc.D., John C. Lutz, Max Kisliuk, Jr., Wm. W. Chapman.

The subscription price per year of ten (10) numbers is as follows:

United States and possessions, Central and South America	**$3.00**
Canada	**3.15**
Foreign	**3.25**

Single copies 35 cents.

ADVERTISING RATES: Full width of page. Payments in advance.
One issue, 1 in., $ 1.20, 2 in., $ 2.40, half page, $ 4.00, full page, $ 7.00
Ten issues " 11.00, " 20.00, " 35.00, " 60.00

SUBSCRIPTIONS. All remittances and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to

ENTOMOLOGICAL NEWS, 1900 Race Street, PHILADELPHIA, PA.

All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time such numbers, if available, will be supplied only by purchase. Not more than two issues will be replaced gratis, through loss in transit or in change of address, unless such have been registered, at the subscriber's expense. No subscriptions accepted which involve giving a receipt acknowledged before a notary, except at the subscriber's expense.

MANUSCRIPTS AND ADVERTISEMENTS. Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

TO CONTRIBUTORS. All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Owing to the limited size of each number of the NEWS, articles longer than six printed pages will be published in two or more installments, unless the author be willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

Proof will be sent to authors. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks (or pay in advance the cost of making blocks) and also pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

Stated Meetings of The American Entomological Society will be held at 8.00 P. M., in 1934, on the fourth Thursday of each month excepting February, June, July and August, and on the third Thursday of February.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the "News" will furnish reprints of articles without covers over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents; three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates. Printed covers for 50 copies, $4.00 or more, according to number of pages bound.

ENTOMOLOGICAL NEWS

VOL. XLV. DECEMBER, 1934 No. 10

Notes on a New Manual of North American Diptera, Comments and Criticisms.

By EZRA T. CRESSON, JR., the Academy of Natural Sciences of Philadelphia.

Of the past students of American Diptera, four stand out pre-eminently as founders and builders: Baron C. R. Osten-Sacken, Dr. Hermann Loew, Dr. Samuel W. Williston and Dr. John M. Aldrich. Osten-Sacken, by his epistolary and personal contact with many of the foremost European dipterists, developed a conservative and prophetic attitude which inspired him to secure North American material, to have it studied by the famous dipterist Loew, and to deposit it in an American institution, the Museum of Comparative Zoology. This collection, which otherwise would have probably remained in Europe and have been inaccessible to most American students, is the most valuable type-collection of North American Diptera. The published records of the labors of these two students are the three volumes of "Monographs of the Diptera of North America," the ten numbers of "Diptera Americae Septentrionalis Indigena," the "Prodrome of a Monograph of North American Tabanidae," and the two editions of the "Catalogue of the Described Diptera of North America." This collection may be considered the foundation of, and these published workers the first important stones in building, American Dipterology. Williston laid another such stone in publishing his "Manual of North American Diptera," which went through three editions and was in such demand that it became unprocurable, except from second hand dealers, about ten years after the appearance of its last edition. The growing interest in this order, in consequence of the appearance of these classics, resulted in the discovery of many new and unrecorded genera and species, a situation which made necessary a revision of our

catalogue. This, another important stone, was laid by Dr. Aldrich with his "Catalogue of North American Diptera," the demand for which was such that it was practically out of print in less than twenty years. These four students, by their works and profound opinions in this field have given us a nucleus to which it will be well for us to adhere, to follow the precepts they have given us, ignoring the frivolities and erraticisms which are so prevalent today and which threaten to weaken the structure began by these excellent builders.

We now have in embryo another stimulus in "The Families and Genera of North American Diptera," by C. H. Curran. This work, modeled in many respects after Williston's Manual, will, or should, be another important stone in our building, and will no doubt have much influence in the study of this order. It is a large octavo size book of 512 pages and very well printed, with the great majority of its illustrations clear and instructive. Many of the latter are taken *in toto* from Williston's Manual, many are from the pen of the author, others from recently published synopses. A colored plate illustrates a few of the conspicuous species of several families. There are chapters on collecting, the care of collections, on some economic species, morphology, classification, and finally a glossary of terms used in dipterology, the latter comprising fourteen pages and some pertinent illustrations. The copious index of seventeen pages not only refers to the page on which a particular genus is given, but the more important synonyms are referred to the proper genus.

The keys had, of necessity, to be enlarged to include the many additional families and genera, and here we have a very commendable feature—the references, by footnotes, to the published revisions of some of the genera, thus giving the student access to the literature by which he may be able to carry his identifications to species. It also was a laudable gesture on the part of Dr. Curran to place the excellent portrait of Dr. Williston as the frontispiece. In dedicating "this book to his memory" the author pays him, as he rightly should, due respect, by acknowledging the influence that profound student

and teacher has exerted. Such a work as this would be almost that of a life-time were it not that Williston had paved much of the way. It is refreshing to see that the well-known Meigen 1803 generic names, upon which many families are based, are retained; thus placing a damper on the recent attempts to overthrow many of these long established names. I am also glad to see that the author prefers to follow the simple nomenclature of Osten-Sacken and Williston as opposed to the recent endeavors to homologize the morphological parts in the various orders of insects, resulting in the creation of many long and unfamiliar terms.

Students, particularly the novitiate, will probably encounter some difficulties working with the keys. Some of the terms used are not self-explanatory, nor are they to be found in the appended glossary (*e.g.*, stigmatical bristles), and some of the characters used are not very satisfactory. However the latter cannot always be avoided, although the advice of students who are known to be authorities in the groups concerned would have probably materially reduced the number of such cases. The author's remarks under classification will bear much consideration and the student or reader will at once be aware of incongruities after a perusal of the mainpart of this work. His definition of good and bad descriptions is well stated, but I cannot see that he had followed his precepts in regard to the new genera and species he herein proposes. He says "there is nothing more pleasing than a good description and nothing more aggravating than a poor one." In my opinion, a good description not only contains a statement of the essential morphological and color characteristics, but includes information as to what the specimen is, when and where captured and by whom, and where at present deposited, if these data are available, as they usually are. Many of the new genera herein erected are based on poorly described genotypes of which nothing is stated except "n.sp." and with a general locality as its habitat, the latter sometimes omitted, leaving the assumption that the specimen is at least from somewhere in North America. He warns against too great specialization, but states that the

collector (he probably means student) of a single family "may produce a monumental work . . . while the general worker is not liable to accomplish lasting results." This is well taken and the idea should be seriously deliberated on by some of our taxonomists. Apropos of this sentiment, let us take a serious student, who, in working up a faunistic collection, encounters species with which he is not materially familiar and must rely on the literature alone, and his acquaintance with the latter may not be very extensive. Would it not be better for him to turn such material over to the proper authorities for identification with the privilege of describing the new forms? This is rather idealistic but if actually followed would do much towards the advancement of our science. Dr. Curran's attitude toward subgenera, subspecies and varieties is of course unreasonable. At least such opinions should not be so positively expressed in a work of this nature. These terms when properly used, which we must acknowledge is not always the case, represent certain rational groupings.

The name of a family is that first proposed for the group containing the type genus. Article 4 of the International Rules of Zoological Nomenclature states that "the name of a family is formed by adding the ending idae . . . to the stem of the name of its type-genus."[1] The type-genus is thus automatically designated by tautonomy; and once the type-genus is so established no other genus is valid as such for that group. The fact that the Commission on Nomenclature used the term "type-genus" implies that it recognized such an entity. As the type of a genus is not necessarily its oldest species (in name), so the type of a family is not its oldest genus, but that used in the construction of the name of the group to which it belongs. One of the first authors to divide the species of Linnaeus and Fabricius into groups, many of which are recognized as families to-day, was Latreille in 1809. He, however, did not use the orthodox family endings, but called his groups families and named them after particular genera. Hence we

[1] See also Oberholser's The Nomenclature of Families and Subfamilies in Zoology (Science, n.s., LIII, pp. 142-147, 1920.)

find Tabanii containing the genus *Tabanus;* Bombylarii containing *Bombylius.* Subsequent authors have with few exceptions retained these type-genera as bases of family concepts; but recently there is a tendency to use the oldest genus as the type, thus subjecting the family concept to continual change every time a still older genus is included.

Apropos of the above, I here register my protest against the use of Trupaneidae for TRYPETIDAE, Lauxaniidae for SAPROMYZIDAE, Phyllomyzidae for MILICHIIDAE, Metopidae for SARCOPHAGIDAE, Tetanoceridae for SCIOMYZIDAE. The substitution of Otitidae for Ortalidae cannot very well be avoided on account of the previous use of the name *Ortalis* in Ornithology; but really little or no confusion would result in its retention in Entomology. The above-mentioned changes are recognized in the present manual and are based on the oldest genus scheme, but the author is not consistent in this matter. Why use Opomyzidae when *Anthomyza* and *Geomyza* are both ten years older? *Geomyza* has had the longer use of the two and should be retained as the type-genus. Also, why use Ephydridae instead of Ochtheridae, when *Ochthera* is ten years older than *Ephydra.* I will take this opportunity to call attention to another attempt to change a well-established family name. In the latest, the third edition of Imm's Entomology, Anthomyiidae is substituted for MUSCIDAE. If the Anthomyiidae do not deserve recognition as separable from the Muscidae, their name should give way not only to the older family name but to the older type-genus. I sometimes think the following rules would be good ones to establish: Do not change any name that has been in constant use for ten years, unless absolutely necessary to avoid confusion. A name proposed in a publication having a general normal circulation should have preference over one published in a medium having relatively no circulation or only among a few interested students. A name accompanied by a good description and figure shall have preference over one so poorly described that it is unrecognizable until the type-specimen has been redescribed if the latter exists.

Although the validity of most of the new genera and species, which the author of this manual has unfortunately here pro-

posed, cannot be ignored, the manner in which they have been presented is certainly open to severe criticism and is not befitting an advocate of good descriptions. In one instance I note that a new genus is proposed for a species from the East Indies. Surely a manual of North American Diptera is no place in which to describe East Indian genera.

On the last page of this manual is imprinted "Published, August 25, 1934." I have also received advice from the publisher that over one hundred copies were mailed and expressed on that date. A copy was received by The American Entomological Society on August 27th by parcel post bearing the post office cancellation dated August 25, 1934. The printing is the work of The Ballou Press, owned by the well-known entomologist, Mr. Charles A. Ballou, Jr. The binding is exceptionally practical, done in such a manner that the book will readily stay open at any page. The work may be purchased of John D. Sherman, Jr., Mount Vernon, N. Y., at $7.50, plus postage, per copy.

Dates on which the Immature or Mature Sexual Phases of Ants have been Observed (Hymen.: Formicoidea).

M. R. Smith, State College, Mississippi.

(Continued from page 251.)

June 16-30: Ponera trigona var. *opacior* (Q.) Oxford, (M.) Louisville; *Eciton* (*A.*) *pilosus* (M.) Wiggins; *Leptothorax curvispinosus* (M., Q.) State College, (Q.) Ripley; *L. wheeleri* (M. P., M. Q.) Sturgis; *L.* (*D.*) *pergandei* subsp. *flavus* (M.) Walnut; *Solenopsis xyloni* (Q.) State College, (M.) Lexington, (Q. P.) State College, (M.) Clarksdale, (M.) State College; *Strumigenys louisianae* subsp. *laticephala* (M.) West Point *Aphaenogaster treatae* (Q.) Walnut; *Monomorium minimum* (M.) Oktoc, Starkville, Itta Bena, Lexington; *Pheidole dentata* (M., Q.) West Point, (Q.) Ripley, Walnut; *Ph. vinelandica* (M.) West Point, (Q.) Ripley; *Ph. metallescens* subsp. *splendidula* (M., Q.) Sibley; *Ph. dentigula* (M. P., M.) Louisville; *Dolichoderus mariae* (Q.) Louisville; *Camponotus herculeanus* subsp. *pennsylvanicus* (Q.) Ripley; *Formica pallidefulva* subsp. *schaufussi* (M.) Dossville.

July 1-15: Solenopsis pergandei (Q.) Quitman; *Strumigenys louisianae* (Q.) Sibley; *Aphaenogaster lamellidens* var. *nigripes* (M., Q.) Cruger; *A. treatae* (M., Q.) Williamsville; *Crematogaster laeviuscula* (M., Q.) West Point; *Myrmecina graminicola* subsp. *americana* (M.) State College; *Iridomyrmex pruinosus* var. *analis* (Q.) Williamsville; *Dorymyrmex pyramicus* (M.) Williamsville; *D. pyramicus* var. *flavus* (M., Q.) Wiggins; *Pogonomyrmex badius* (M., Q.) Quitman.

July 16-31: Sysphincta pergandei (M.) Ripley; *Solenopsis xyloni* (M., Q.) Lexington; *S. molesta* (Q.) Ackerman, Longview, Starkville; *Strumigenys louisianae* subsp. *laticephala* (M.) West Point; *S. membranifera* subsp. *simillima* (Q.) Columbus; *Crematogaster ashmeadi* (M.) Longview; *C. lineolata* (Q.) Ripley; *Pheidole dentata* (Q.) Sessums, (M.) Cedar Bluff, (M. Q.) Longview; *Ph. vinelandica* (Q.) Duck Hill; *Ph. metallescens* subsp. *splendidula* (Q.) Ackerman; *Tetramorium* (*T.*) *striatidens* (Q.) West Point; *Pogonomyrmex badius* (Q.) Columbus; *Myrmecina graminicola* subsp. *americana* (M.) State College; *Brachymyrmex* sp. (Q.) Ripley.

August 1-15: Ponera trigona var. *opacior* (Q.) West Point; *Ph. pilifera* (M.) Muldon; *Ph. dentata* (M., Q.) Pickens, (M.) Belzoni; *Pseudomyrma flavidula* (Q.) Fayette; *Brachymyrmex* sp. (M., Q.) Fayette.

August 16-31: Euponera gilva (M.) Aberdeen; *Proceratium croceum* (M., Q.) Aberdeen; *Sysphincta pergandei* (M.) Artesia; *Monomorium pharaonis* (M.) West Point; *Camponotus caryae* var. *decipiens* (M.) Columbus; *Lasius niger* var. *americana* (M., Q.) West Point.

September 1-15: Solenopsis xyloni (Q.) Osborn, (M. P., M., Q.) Louisville; *Tetramorium guineense* (Q.) Pascagoula; *Pogonomyrmex badius* (Q.) Wiggins; *Stenamma* sp. (Q.) Weir; *Dolichoderus plagiatus pustulatus* var. *beutenmuelleri* (Q. P., Q.) Biloxi.

September 16-31: Ponera coarctata subsp. *pennsylvanica* (Q.) Corinth.

October 1-15: Solenopsis xyloni (Q.) West Point; *Iridomyrmex pruinosus* var. *analis* (M.) Mendenhall; *Camponotus caryae* (Q.) Jackson; *Lasius niger* var. *americana* (Q.) West Point.

October 16-31: Leptothorax fortinodis (M.) State College; *Solenopsis xyloni* (M., Q.) Mendenhall; *Iridomyrmex humilis* (M. P., M.) Aberdeen, (M.) Eupora; *Tapinoma sessile* (M.) Sturgis; *Camponotus caryae* var. *decipiens* (M., Q.) Starkville.

November 1-15: Ponera opaciceps (M., Q.) Quitman; *Formica pallide-fulva* subsp. *schaufussi* (M., Q.) Pascagoula.

November 16-30: Ponera opaciceps (Q.) Lucedale, (M.) Quitman; *Eciton* (*A.*) *schmitti* (M.) Baton Rouge, Louisiana; *Solenopsis xyloni* (M. P.) New Albany; *Iridomyrmex humilis* (M.) Quitman.

December 1-15: Ponera opaciceps (M., Q.) Ocean Springs.

December 16-31: Camponotus caryae rasilis var. *pavidus* (Q. P.) Lucedale.

General Conclusions.

One should be very slow in drawing too definite conclusions from the data presented above. In some instances there are too few records; in others there is so much variation in the dates that nothing very conclusive is offered; again, the species have been taken from such widely remote localities and from such different types of nests that the matter is made even more difficult.

In order, however, to bring out the most outstanding points in connection with the records, it would be best to discuss the subject under the following heads: (a) those ants which produce their sexual forms early in the season, (b) those ants which produce their sexual forms late in the season, and finally (c) those ants in which some of the males and females overwinter in the nest.

Some of the species which produce one or both of their sexual forms early in season are as follows: *Monomorium minimum* Buckley, *Crematogaster laeviuscula* var. *clara* Emery, *C. victima* subsp. *missouriensis* Emery, *Pheidole dentata* Mayr, *P. vinelandica* Mayr, *Pseudomyrma pallida* F. Smith, *Iridomyrmex humilis* Mayr, *I. pruinosus* var. *analis* Andre, *Tapinoma sessile* Say, *Dorymyrmex pyramicus* Roger, *Camponotus* (*Colobopsis*) *mississippiensis* M. R. Smith, *C.* (*C*) *pylartes* var. *fraxinicola* M. R. Smith and others.

Among the species which usually do not produce their sexual phases until late in the season may be mentioned: *Sysphincta pergandei* Emery, *Proceratium croceum* Emery, *Euponera gilva* Roger, and *Lasius niger* var. *neoniger* Emery. This habit seems to be more common in the subfamily *Ponerinae* than in any other subfamily of ants. That in some instances at least the sexual forms of certain species of *Ponerinae* are produced

early is shown by the records of *Ponera trigona* var. *opacior* Forel, which produced queen pupae as early as the latter part of May.

It seems to be a very constant custom among many species of *Formicine* ants for the sexual phases to overwinter in the nest. I have observed this consistently among *Camponotus herculeanus* subsp. *pennsylvanicus* DeGeer, *C. castaneus* subsp. *americanus* Mayr, *C. Caryae* Fitch, *C. caryae* subsp. *rasilis* Wheeler, *C. caryae rasilis* var. *decipiens* Emery, *C. caryae rasilis* var. *cnemidatus* Emery. *Prenolepis imparis* Say and its various varieties also have this habit as well as *Paratrechina* (*Nylanderia*) species. I was greatly surprised, however, to learn that some of the *Dolichoderinae* also frequently overwinter as adult males and queens as for example *Dorymyrmex pyramicus* Roger. In rare instances we have found sexed forms of Myrmicine ants over-wintering in the nest, as *Crematogaster ashmeadi* Mayr and *C. opaca depilis* var. *punctulata* Emery. In the southern part of Mississippi winged queens and males of *Ponera opaciceps* Mayr have been taken from the nest during January and February, which are our most severe winter months.

In winter the immature stages are usually represented by larvae.

Applied Entomology in Public Health.

The Rockefeller Foundation expended for public health work during 1933 the sum of $3,286,063.01. It supported laboratories for yellow fever research in Lagos, Nigeria; Bahia, Brazil; and New York City. It completed, in cooperation with various governments of West Africa, an extensive survey which disclosed the areas in Africa where yellow fever occurs; assisted the governments of Brazil and Bolivia in an extensive program of yellow fever control; conducted experiments and studies on the vaccine and virus of yellow fever and on the mosquito vectors of this disease; aided three states in the United States and seventeen foreign governments in antimalaria work; carried out malaria studies and surveys in various parts of the world and engaged in many other enterprises designed to improve public health.

A List of Scarabaeidae Collected at Clemson College, South Carolina (Coleoptera).

By O. L. CARTWRIGHT, Clemson College, South Carolina.

(Continued from page 240.)

13517 PH. DRAKEI (Kirby). 9 records. April 21 to July 6.
13519 PN. BARDA (Horn). 3 records. March 26, April 19, and May 3.
13520 PH. MARGINALIS (Lec.) 7 records. April 24 to June 3.
13523 PH. FORSTERI (Burm.) Very common. (Feb. 15), April 2 to July 15.
13525 PH. LUCTUOSA (Horn) One record. April 26.
13532 PH. HIRSUTA (Knoch). Common. March 24 to June 11.
13536 PH. VILLIFRONS Lec. One record. April 26. B. F. Driggers*.
13538 PH. HIRTICULA (Knoch). Common. April 19 to July 14.
13540 PH. ILICIS (Knoch). Common. April 15 to July 25.
13542 PH. AEMULA Horn. Rare. One record. June 27.
13544 PH. CRENULATA (Froelich). 6 records. April 17 to June 26.
13556 PH. QUERCUS (Knoch). A late summer species. Common. June 28 to Sept. 15.
13563 PH. TRISTIS (Fab.). 2 records. April 14 and 19.
19982 PH. FOXII Davis. 4 records. April 24 to 28.
13653 DICHELONYX FUSCULA Lec. Common on buds of oak. April 12 to 27.
13686 MACRODACTYLUS ANGUSTATUS (Beauv.). June 25 to July 27.
13695 HOPLIA TRIVIALIS Harold. Common. March 14 to April 21.
13697 H. MODESTA Hald. Common on flowers of swamp dogwood, *Cornus stricta*, Lam., May 11 to June 18.
13709 ANOMALA BINOTATA Gyll. Mch. 3 to May 4.
13715 A. MINUTA Burm. Rare. One record, Aug. 2
13720 A. FLAVIPENNIS Burm. 3 records. June 9 to 12 (trap light).
13730 A. UNDULATA Melsh. 11 records. May 28 to July 7.
13731c A. SAGINATULA Casey. 3 records. April 19 to May 4.
13739 PACHYSTETHUS MARGINATA (Fab.). 4 records. June 22 to July 30.
13741 P. LUCICOLA (Fab.). One record. June 15.
13742 P. OBLIVIA (Horn). 3 records. June 17 to 21.
13747 STRIGODERMA ARBORICOLA (Fab.) May 28 to July 3.

* Record from: Luginbill, Philip—"The Beetles of the Genus Phyllophaga Inhabiting South Carolina." Ann. Ent. Soc. Am. v. XXI, 1928, p. 89.

13750 Strigodermella pygmaea (Fab.) 2 records. July 30 to Aug. 7.
13757 Pelidnota lutea (Oliv.) 2 records. July 1 and 12.
13757b. P. lutea var. pallidipes Casey. Common. June 3 and July 25.
13769 Cotalpa lanigera (L.) 8 records. April 8 to May 17.
13787 Polymoechus brevipes Lec. 11 records. July 13 to Aug. 17.
13801 Ochrosidia immaculata (Oliv.) Common. June 15 to Aug. 12.
13829 Dyscinetus trachypygus (Burm.) 7 records. April 15 to Oct. 2.
13835 Euetheola rugiceps (Lec.) Common. Feb. 25 to Nov. 15.
13843 Ligyrus gibbosus (DeG.) Common. April 13 to Aug. 20.
13868 Aphonus tridentatus (Say). Not uncommon. July 8 to Sept. 2.
13878 A. castaneus (Melsh.) 2 records. July 2 and 28.
13897 Strategus pinorum Casey. June 6 to Sept. 27.
13902 Xyloryctes satyrus (Fab.) One record. Sept. 14.
13908 Dynastes tityus (L.) 6 records. June 12 to Aug. 2.
13911 Phileurus truncatus (Beauv.) 17 records, all from within houses. May 8 to Oct. 11.
13918 P. castaneus Hald. 3 records. July 7, Oct. 20 and 30.
13931 Cotinis nitida (L.) Common. June 23 to Aug. 12.
13937 Euphoria fulgida (Fab.) 2 records. April 28 and May 8.
13938 E. herbacea (Oliv.) Rare. One record, July 11.
13940 E. inda (L.) 6 records. March 18 to April 18.
13953 E. sepulchralis (Fab.) Common. April 6 to Nov. 30.
13955 E. scolopacea Casey. Common. April 2 to Sept. 28.
13972 Cremastocheilus harrisi Kby. 5 records. March 12 to May 7.
13973 C. canaliculatus Kby. One record. April 21.
13980 C. variolosus Kby. One record. June 9.
14010 Osmoderma scabra (Beauv.) Rare. One record, July 15.
14015 Trigonopeltastes delta (Forst.) Common. May 24 to Aug. 15.
14016 Trichiotinus piger (Fab.) Common. May 6 to July 13.
14025 T. affinis (G. & P.) One record. May 22.
14027 T. bibens (Fab.) 6 records. May 22 to June 22.
14030 Valgus seticollis (Beauv.) 5 records, March 19, April 21 (Oct. 14).
14031 V. canaliculatus (Fab.) Common. Feb. 26 to June 24.

New Species of Terapus from North America (Histeridae, Coleoptera).

By Howard E. Hinton, Berkeley, California.

The genus *Terapus* Mars. is typically neotropical. Three species have been described from North America, *T. mniszechi* Mars. (1862) from Mexico, *T. infernalis* (Fall) (1907) from California, and *T. mexicanus* Mann (1926) from Mexico. In this paper two additional species are described from Mexico.

Terapus balloui, new species.

Rufo-piceous, shining. Head concave, sparsely, coarsely, irregularly punctate; front concave, with a shallow impressed line extending to base of labrum; clypeus and labrum smooth, anterior margin of labrum truncate, piceous, sparsely pubescent; sides in front of eyes thickly margined, the margins diagonal above and extending to the median impressed line.

Pronotum one-fourth wider than long, sides nearly straight and slightly convergent towards apex; disk moderately densely, finely, evenly and setigerously punctate; anterior margin broadly and deeply emarginate at middle; anterior angles broadly rounded and slightly reflexed, posterior angles obtusely angulate; anterior marginal lobe slightly longer than posterior and both bordering a depressed, flat, triangular area in the middle of which is a small, rounded tubercle bearing a few yellow trichomes.

Elytra broader than long, humeri gibbous, basal margin with several short, shallow impressions; surface coarsely punctate, sparsely pubescent with the pubescence arranged indefinitely in four rows on each elytron.

Propygidium transversely hexagonal, sparsely, moderately finely, evenly, setigerously punctate, base finely tuberculate, opaque and separated from the apical portion by a deeply sinuate line; apex with a low transverse carina divided at middle. Pygidium about as long as broad, sparsely, moderately finely, evenly and setigerously punctate. Ventral surface moderately finely, setigerously punctate; prosternal keel arcuate opposite coxae and slightly broader anteriorly; no dividing line between meso- and metasternum, mesosternum with a finely impressed, interrupted line.

Legs short, stout, slightly more rufous than body; femora stout, concave on ventral edge; tibiae dilated, broadly triangular, concave on ventral edge, with a few short spines on apex; hind femora broad, nearly twice as stout as middle femora and with

a transverse, rounded lobe at base of dorsal border, on the basal half of the outer side is a large, gradually rounded tubercle; hind tibiae with the apical edge straight, not half as long as dorsal edge, ventral longer than dorsal, extending for about half the length of the inner side of the dorsal edge is a narrow, concave area containing golden trichomes, on basal one-fifth of ventral half of outer lobe is a long, prominent tubercle. Length, 2 mm.; breadth, 1.2 mm.

The *type* (No. 3747 Mus. Calif. Acad. Sci.) and seven paratypes were collected by the writer at Real de Arriba, District of Temascaltepec, MEXICO, in July, 1932, at an elevation of 6,300 feet. Two additional paratypes were collected by J. C. Hinton at the same locality and in the same month as above. Five additional paratypes were taken by R. L. Usinger and the writer in July, 1933, at the same locality as above. All specimens were taken in the nests of *Pheidole kingi* Pergande. Paratypes are deposited in the collections of Dr. W. M. Mann and Mr. C. A. Ballou for whom the species is named.

This species is closely related to *T. mexicanus* Mann, but it may be separated by the presence on the outer face of the posterior tibiae of a large, prominent tubercle.

Terapus nigritus, new species.

Black, shining. Head concave, very coarsely and very densely punctate. Front concave, with a smooth median line extending to base of labrum; sides in front of eyes thickly margined, margins diagonal above and extending forward as carinae bordering the median impressed line; clypeus and labrum coarsely and densely punctate.

Pronotum one-half wider than long, slightly narrower in front; disk coarsely and densely punctate, anteriorly and at sides more densely punctate; anterior angles truncate, strongly reflexed; anterior marginal lobe longer and wider than posterior; both lobes border a depressed, flat, triangular area in the middle of which is a very large, round tubercle bearing a thick brush of goldern trichomes.

Elytra coarsely and densely punctate, slightly broader than long; humeri gibbous, with a prominent carina extending on the sides of the elytra to the apex which is truncate; in the middle of the elytra next to the suture is a small, smooth, glabrous, highly polished area.

Propygidium transversely hexagonal, coarsely, very densely punctate; transverse carina near apex thickened and divided at

middle forming two approximate tubercles. Pygidium slightly broader than long, coarsely and densely punctate. Ventral surface coarsely, densely punctate and sparsely pubescent; prosternal keel very coarsely punctate, arcuate opposite the coxae and strongly broadened anteriorly; no dividing line between meso- and metasternum, meso-metasternum with an impressed and interrupted, longitudinal line; meso-metasternum and middle of abdominal segments more sparsely and finely punctate.

Femora stout, concave on ventral edge; tibiae dilated, broadly triangular, ventral edge grooved for entire length; hind femora twice as stout as middle femora, outer-side strongly convex, with a transverse lobe at basal border; ventral edge of hind tibia half as long again as dorsal edge and twice as long as apical edge. Length, 2.5 mm.; breadth, 1.8 mm.

The *type* (No. 3746 Mus. Calif. Acad. Sci.) and one paratype were collected by R. L. Usinger and the writer at Real de Arriba, District of Temascaltepec, MEXICO, on July 9, 1933, at an elevation of 6,300 feet. Both specimens were taken in the nests of *Pheidole kingi* Pergande.

Terapus nigritus has the proportionally short legs of *T. mexicanus* Mann and *T. balloui* Hntn., but the robust body and dense, coarse punctation would place it close to *T. mniszechi* Mars. and *T. infernalis* (Fall), from both of which it differs in its black instead of rufo-piceous color. The following table will serve to separate the species:

A Key to the Species of Terapus North of South America.

1. Hind tibia with a very prominent tubercle on the outer face ..... *T. balloui* Hntn.
   Hind tibia without a prominent tubercle on the outer face ..... 2.
2. Inner face of hind tibia only slightly concave; outer face only slightly convex; pronotum finely and sparsely punctate ..... *T. mexicanus* Mann
   Inner face of hind tibia rather strongly concave; outer face strongly convex; pronotum at least moderately densely punctate ..... 3.
3. Basal portion of hind tibia not strongly dilated for about one-fourth the length of the tibiae ... *T. infernalis* Fall
   Hind tibia dilated from near the base..... 4.
4. Rufo-piceous: upper surface moderately densely pubescent with long hairs ..... *T. mniszechi* Mars.
   Black; upper surface pubescent only with very fine, short hairs ..... *T. nigritus* Hntn.

The Status of the Genus Rhinopsis, with Description of a New Species from Texas (Hymen.: Ampulicidae).

By J. Chester Bradley, Cornell University, Ithaca, New York.

Rhinopsis was founded by Westwood for his species *abbottii* which is a synonym of *canaliculata*. Authors have usually looked upon its sole distinguishing character as being the absence of the first transverse cubital vein, and since this vein is not constantly present in some species of *Ampulex*, and also since some of the forms that lack it do not seem to be closely related in other respects to others, there has been a tendency to consider *Rhinopsis* an unnatural group, which should not be recognized even as a subgenus.

Authors seem to have overlooked a character which the type of *Rhinopsis* shares with all of the known new world species that possess only two submarginal cells, namely that the first section of the subdiscoidal vein (m of the Comstock-Needham terminology) is continuous with the second recurrent, there being no trace of a second section of the subdiscoidal (longitudinal M_2 of Comstock and Needham). The continuous subdiscoidal and second recurrent veins enclose an elongate third discoidal cell which is gradually narrowed toward the apex and there more suddenly terminated by the upcurving second recurrent.

This character I have observed in *canaliculata* Say, in *ferruginea*, n. sp., in *trigonopsis* Smith, and it is shown by the figure of *maculicornis* Cameron in the Biologia Centrali Americani to obtain in that species. There are no other new world species known to have only two submarginal cells.

In all of the other *Ampulex* that I have seen, new or old world species with three submarginal cells, or old world species with two, including the European *fasciata* Jurine, the second section of the subdiscoidal vein is present, the first meets the second recurrent at an angle, and the third discoidal cell is not gradually narrowed but terminated by the more or less rectangular second discoidal vein.

It therefore seems that our American species allied to *canaliculata* form a natural group which may be properly accorded at least subgeneric rank.

KEY TO SUBGENERA OF AMPULEX.

Subdiscoidal and second recurrent veins of fore wing continuous, not meeting at an angle, the apical section of the former vein wanting. First transverse cubital vein wanting. Color black or ferruginous, never strongly metallic. Neotropical and Nearctic Regions, *Rhinopsis* Westwood.

Subdiscoidal and second recurrent veins not continuous, the latter inserted at an angle on the former, which it divides into a basal section and an apical section. Two or three submarginal cells. Colors usually, but not always strongly metallic. Old and new worlds. ....*Ampulex* Jurine.

Specimens of the only known nearctic species of *Ampulex* are looked upon as such rarities that the discovery of a second form is of considerable interest. The form hereunder described is very closely related to *A. canaliculatus* Say, and differs chiefly in being, except for the abdomen, entirely yellowish ferruginous, instead of black. Structurally it differs from a specimen of *A. canaliculata* before me but slightly, chiefly in the sculpture of the mesopleura, in two pits on the vertex, and in the fact that the petiole appears a little longer. Whether these are individual or persistent distinctions, it will take additional specimens to decide. If not a morphologically distinct species, it doubtless represents a geographical color form.

Ampulex (Rhinopsis) ferruginea n. sp.

♂. Entirely ferruginous except the abdomen beyond the petiole, which is piceous and polished, and the petiole which is testaceous. Wings hyaline, a fuscous area abruptly delineated basally across the wing beneath the stigma, but gradually disappearing before the apex; a small cloud also at the apex of the submedian cell. Length 8 mm.

Head roundly but strongly contracted behind the eyes, the occiput not distinctly margined, but inferiorly with a weak tubercle or suggestion of the termination of a carina (*canaliculata* has these and the bordering carina of the occiput a little stronger); inner margins of the eyes very slightly divergent toward clypeus; clypeus strongly convex medially, depressed beneath each antenna, a trace of a median carina visible on its crest only at extreme apex, where it becomes a short apical mucronate tooth, the apical border otherwise rounded; surface of clypeus minutely pubescent, and with some longer hairs apically, the median convex part crossed by a faint transverse impression (strong in *canaliculata*); mandibles slender, attached normally beneath the eyes, with a very short malar space; dis-

tance from foramen magnum to buccal orifice two-thirds the length of the third antennal segment; distance between ocelli one-half of the minimum distance between them and compound eyes; minimum width between eyes four-fifths the length of segment 3 of antenna; this about six times longer than the pedicel, two and one-half times longer than the scape; segments 4 and 5 about equal to each other and to the scape, the two together about one-eighth shorter than segment three; front with a round lobe overlying the base of each antenna, leading above into a very short and weak frontal carina; no median carina; front and vertex opaque, with evenly scattered fine punctures; a pit behind each posterior ocellus (absent in *canaliculata*).

Pronotum longer than wide, the anterior half divided by a median sulcus into a right and left rounded ridge, the dorsal surface with weakly indicated suggestion of fine rugosity, anteriorly this is only on the summits of the ridges, but covers the entire dorsal surface posteriorly; lateral surfaces smooth and impunctate. Mesonotum with sharply defined parallel parapsidal furrows, extending from anterior to posterior margins, with weakly defined lateral furrows on the posterior half, and with two short furrows between the parapsidals on the anterior margin; surface smooth, and chiefly between the parapsidal furrows with minute ill-defined punctulation, regularly but not closely distributed, just discernible at x35 magnification; a pit-like depression near the postero-lateral angles, which are in turn somewhat elevated, slightly hood-like. Scutellum with deep lateral foveae, its disc sculptured like the middle section of the mesonotum; postscutellum impunctate; mesopleura obsoletely rugulose, in places somewhat reticulate, but without distinct rows of punctures as in *canaliculata*. Epicnemial carina sharp; pleura separated from the mesosternum by a poorly defined depressed line, scarcely a definite sulcus. Mesosternum smooth; at x35 scattered setigerous punctulation is evident, and a background of minute shagreening. In this species and in *canaliculata* the mesosternum between the middle coxae is convexly rounded, not flattened and not forming a strong ridge or median line; posteriorly the ordinary furcula is replaced by a downward projecting U-shaped translucent lamina, which connects one hind coxa with the other. Postero-lateral area of propodeum with a small erect tooth; dorsal surface of propodeum horizontal, at right angles to the vertical posterior face; dorsal surface with a weak median carina, and four lateral carinae on each side, the fourth bounding the top of the lateral face; the first lateral pair, distant at the base from the median, approach it and finally disappear before uniting

with it apically, setting off between them a triangular area which is darker in color than the rest of the body; the next two pairs of lateral carinae closer to each other than to the first pair, and the second and third a little closer than the third to the fourth; the median triangle radially striated at base, transversely at apex, the interval between carinae 1 and 2 transversely striated, that between 2 and 3 as likewise 3 and 4 transversely striate but the striae sufficiently short and separated to form rectangular meshes; the lateral faces obsoletely rugulose, contrasting with the smooth metapleura below them; the posterior face slightly rounded, with a very weak vertical median carina, and obsoletely transversely wrinkled, but not above.

The forewings have entirely lost all trace of the first transverse cubital vein. The united first and second submarginal cells extend about half way from the tip of the median cell to the wing apex. The marginal cell is long and pointed, its extreme tip slightly removed from the margin, forming a very small appendiculate cell. The second transverse cubitus is transverse. The first and second sections of the radius are of about equal length, longer than the third, which is about equal to the second transverse cubital vein. The third transverse cubitus curves obliquely outward to the cubital vein. The third discoidal cell is elongate gradually and evenly narrowed until just before the apex the terminating curve becomes pronounced; this by reason of the unusual fact that the first section of the subdiscoidal vein (m of Comstock-Needham system) is entirely continuous with the second recurrent, there being no trace whatsoever of the second section of the subdiscoidal (longitudinal M_2 of the Comstock-Needham system). This arrangement *ferruginea* has in common with *A. canaliculata*. The hind wing does not differ materially from Kohl's figure of *A. compressa*, except that the apical part of the anal vein, the part beyond the submedian cell, is wanting. Femors slender, thickest at the basal third and evenly tapered to the apex; metatarsus .55 of length of tibiae; tarsal segments in proportion of: 9:4:1.5:1:2.2; ultimate segment, as usual, inserted near base of penultimate; claw with an oblique median tooth on the inner margin.

Petiole (measured from apex of hinging nodules at base to where it suddenly enlarges at base of first tergite) as long as the second tarsal segment. Abdomen impunctate, polished and shining, the second tergite little wider than the apex of the first, the third tergite about one-third the length of the second, the apical ones narrowly exposed.

TEXAS: Liberty, 1 ♂, March 18, 1908 (E. G. Tucker). *Holotype* in the United States National Museum.

A New Genus of Cobboldiini and a New Genus of Chrysomyine Flies (Dipt.: Oestridae, Muscoidea).

By CHARLES H. T. TOWNSEND, Itaquaquecetuba, Brazil.

The two African stomach and intestinal botflies of the elephant differ markedly by their metallic coloration from the Indian stomach botfly of the related host. One of the African species was made the genotype of *Rodhainomyia* in 1920, while the other was left in *Cobboldia*, whose genotype is the Indian species. The second African species is accorded generic recognition below, being strikingly distinct from the Indian *Cobboldia*.

PLATYCOBBOLDIA gen. nov.

Genotype, *Cobboldia loxodontis* Brauer. Differs from both *Cobboldia* and *Rodhainomyia* by the strongly flattened male and female head and thorax and female abdomen, also by the metallic blue male and female mesoscutum and male abdomen. Both fly and maggot characters are given in detail by Rodhain & Bequaert in Bull. Biol. France et Belg. LII, 412 (1919).

PYCNOSOMOPS gen. nov.

Genotype, Musca putoria Wd., Africa.

Differs from *Achoetandrus* (genotype, *Musca albiceps* Wd.) mainly by possessing a strong mesopleurospiracular bristle, inferior proximal process of remigium bare, squamae dark-haired on disk.

Lucilia rufifacies Mq. is congeneric with *putoria*, differing at once from latter by lacking the black hind margins of intermediate abdominal segments. It belongs to the Australian fauna.

A New Name for Aphodium smithi Brown (Coleoptera, Scarabaeidae).

Aphodius browni Hinton, new name for *Aphodius smithi* Brown, Canad. Ent. Vol. LXII, p. 2, 1930.

As the name *A. smithi* Brown is preoccupied by *A. smithi* Shipp (Smith. Through Unkn. Afr., Coleopt. App. p. 451, 1897) the species is here renamed *A. browni* as a slight tribute to Mr. W. J. Brown.

Aphodius browni Hntn. is extremely closely related to *A. socialis* Brown, and, indeed, at one time the writer doubted the validity of *A. browni*. *Aphodius browni* is, however, slightly larger and more strongly punctate, and is found in the nests of *Microtus* whereas *A. socialis* is found in the nests of *Thomomys*. According to Mr. Brown, the types of *A. browni* are males and not females as stated by him in the original description.—HOWARD E. HINTON, Berkeley, California.

Some Observations on Notonecta undulata Say (Hemiptera: Notonectidae) and other Aquatic Insects in Winter.

*By JOHN W. STUTZMAN, Reading Public Museum, Reading, Pennsylvania.

It seems to have been taken for granted by hemipterists generally that the various species of the family Notonectidae hibernate during the colder months in the mud and vegetation at the bottom of the ponds they inhabit. Several writers did mention seeing backswimmers active on warm sunny days beneath the ice. No one has reported on how they overwinter except to suggest that they hibernate. On a series of field trips during the month of December, 1933, in the vicinity of Reading, Pa., the writer has found that these insects and those of other aquatic orders were active in frozen ponds even during very cold periods. During one very cold spell, when the air temperature was 18° C. (0° F.), aquatic insects were captured in numbers while actively swimming beneath the ice. Of course the temperature of the air affects these insects only indirectly, while the temperature of the water is of greatest importance. But it stirs the imagination to think that while most insects are imprisoned motionless by cold, there are others placidly swimming beneath the ice of our ponds.

The temperature of water in which these notonectids remain active is surprisingly low. According to Metcalf and Flint the minimum effective temperature for most insects is 6° C. (42° F.). It was not unusual to find notonectids active in water at 2° C and in one instance I have observed a number of *Notonecta undulata* Say swimming at 1° C.

During the trips in the field, the ice was usually so thick and cloudy that it was necessary to cut out blocks of ice with a saw and watch the insects through these windows. The temperature of the water was taken in the following way. A thermos bottle was lowered into the water to the desired depth and the cork pulled out. The bottle was then raised out of

* The encouragement of Mr. Herman Hornig, of the Reading Public Museum in this work is gratefully acknowledged.

the water in a vertical position. The thermometer was then placed in the thermos bottle for several minutes and the reading taken while the thermometer was immersed. In this way, the inaccuracies resulting from the cooling of the thermometer by air, etc., were reduced to a reasonable degree. The following table shows the insects collected which were active beneath the ice and the temperature of the water in which they were found.

INSECTS COLLECTED ACTIVE BENEATH ICE.

Species taken Dec. 10 to Jan. 3		Centigrade Water Temp.	Taken at Flashlight
Hemiptera	*Notonectidae*		
	Notonecta undulata Say	2° to 5°	+
	Buenoa margaritacea T.-B.	4°, + 3°	+
	Corixidae		
	Arctocorixa interrupta (Say)	3° to 5°	+
	Nepidae		
	*Ranatra fusca P. de Beauv.	6°	+
Coleoptera	*Gyrinidae*		
	Dineutes americanus Say (assimilis Kby.)	3° to 7°	+
	Dytiscidae		
	*Rhantus binotatus Harr.	4° to 6°	
	Agabus disintegratus Cr.	4° to 6°	
	Haliplidae		
	Peltodytes muticus Lec.	2° to 7°	
Diptera	*Culicidae*		
	Corethra sp. ? (larvae)	2° to 7°	
Odonata			
Species of Zygoptera		2° to 7°	
Species of Anisoptera		2° to 7°	

Several field trips were made at night. On all of these trips it was noted that *Notonecta undulata* Say and other aquatic insects seemed positively phototropic. On one occasion a hole about two feet square was cut into the ice. The flashlight revealed only about two *Notonecta undulata* Say resting on the bottom. In the next fifteen minutes 33 specimens of the same came into the lighted area and were captured with the water net. A few individuals came to the surface and would swim

* Two specimens only.

swiftly in circles suggesting the erratic flight of moths about a light. Others would drift into the field of light and then drift slowly out as if totally unaffected. The majority, however, came into the lighted spot and then swam slowly to the illuminated bottom, anchored by a leg to the vegetation.

On one trip the cap to a thermos bottle was filled with water and specimens of *Notonecta undulata* Say were captured and placed in it. The night was very cold and the water in the cap began to freeze immediately, but the insects swam actively for about half an hour and were still active when removed. The temperature of this water was 1° C. On another trip several dragonfly larvae were fished out of the pond and thrown aside on the ice. Several hours later that evening, the larvae were found, still able to wiggle. As soon as they were placed in the water they swam to the bottom.

A complete answer as to how the aquatic insects remain alive and active under such vigorous conditions can only be answered by much physiological and ecological study of these highly specialized forms. Wesenberg-Lund (Int. Rev. ges. Hydrobiol, III: 460-86) has made a fine beginning. He shows how the insects obtain their oxygen under the ice, from the oxygen output of aquatic plant photosynthesis. He also states that when the oxygen supply becomes low, hibernation is induced.

Food supply as well as oxygen supply must differ somewhat in character from that of the summer months. *Buenoa margaritacea* is said to live especially on entomostraca. Daphnia, therefore, which was observed frequently on these field trips, should furnish nourishment for *Buenoa*. As to what food there is for other insects we can only conjecture.

It is plausible from the above observations that notonectids are much more active during the winter than we had supposed. They are able to move freely at a temperature four degrees C. or more below that point (6° C.) at which most insects are quiescent. What physiological peculiarities enable them to do this would be most interesting to discover. In fact the whole aquatic field must contain many unusual phases the investigation of which will add much to our biological knowledge.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

GENERAL.—Anon.—Consider the ant. [68] 80: 404. **Brown, A. W. A.**—A contribution to the insect fauna of Lake Timagami. [4] 66: 206-211. **Carr, F. S.**—Obituary. By H. A. M. [4] 66: 211-212. **Feyer, E.**—Nachklänge zu "Bilder aus meinen sammelreisen." [17] 51: 205-209, cont. **Fuller, M. E.**—The insect inhabitants of carrion: a study in animal ecology. [Bul. Counc. Sc. & Indust. Res. Australia] No. 82: 62 pp., ill. **Galapagos** Islands, Norwegian Zoological Exped. to; Scorpiones, by W. Meise; Orthoptera, by M. Hebard; Hemiptera-Heteroptera, by H. G. Barber; Neuropterous insects, by P. Esben-Peterson. [Med. Zool. Mus. Oslo] 74. 25-43; 279-280; 281-289; 291-294. **Kennedy & Landis.**—On writing articles for the Annals of the Entomological Society of America. [7] 27: 357-371. **Linsley & Usinger.**—Insect collecting in California. [55] 10: 102-106. **Neave, F.**—(See under Smaller Orders.) **Osborn, H.**—An entomological forecast. [7] 27: 480. **Titschack, E.**—Die Entomologische Abteilung des Zoologischen Staatsinstituts und Zoologischen Museums in Hamburg. 1932-1933. 64 pp., ill.

ANATOMY, PHYSIOLOGY, ETC.—Auten, M.—The early embryological development of Phormia regina (Calliphoridae). [7] 27: 481-506, ill. **Blackwelder, R E.**—The prostheca or mandibular appendage. [55] 10: 111-113, ill. **Castle, G. B.**—The experimental determination of caste differentiation in termites. [68] 80: 314. **Cole, A. C.**—A

brief account of aestivation and overwintering of the occident ant, Pogonomyrmex occidentalis in Idaho. [4] 66: 193-198. **DeLong, D. M.**—Insecticidally induced immunity in plants to sucking insects. [68] 80: 320-321. **Hendee, E. C.**—The role of fungi in the diet of termites. [68] 80: 316. **Hering, M.**—Hysteroteile bei einer puppe von Carpocapsa saltitans. [97] 54: 329-331, ill. **Koltzoff, N.**—The structure of the chromosomes in the salivary glands of Drosophila. [68] 80: 312-313, ill. **Ludwig, D.**—Studies on the metamorphosis of the japanese beetle (Popillia japonica). [7] 27: 429-434. **Mansour & Mansour-Bek.** The digestion of wood by insects and the supposed role of micro-organisms. [Biol. Rev. Cambr. Phil. Soc.] 9: 363-382. **Martin & Cotner.**—Serological studies of moth proteins with special reference to their phylogenetic significance. [7] 27: 372-383. **Mellanby, K.**—The site of loss of water from insects [Proc. R. Soc. Lond.] B, 116: 130-149. **Melvin, R.**—Incubation period of eggs of certain muscoid flies at different constant temperatures. [7] 27: 406-410. **Nagel, R. H.**—Metathetely in larvae of the confused flour beetle (Tribolium confusum). [7] 27: 425-428, ill. **Poll, M.**—Le système malpighien de Hylecoetus dermestoides. [33] 74: 192-194. **Roubaud, E.**—Au sujet des differentiations raciales chez le moustique commun Culex pipiens. [54] 12: 337-339. **Roubaud et Mezger.**—La nourriture larvaire n'influe pas sur le developement de l'autogenese chez les races de Culex pipiens specifiquement anautogenes. [54] 12: 340-342. **Speicher, K. G.**—Impaternate females in Habrobracon [92] 67: 277-293. **Strasburger, E. H.**—Ueber die zellbewegungen bei der eifurchung der fliege Calliphora erythrocephala [94] 145: 625-641, ill. **Thienemann, A.**—Chironomiden-Metamorphosen. [59] B, 7: 29-46. **Voukassovitch, H. et P.**—Variations dans la duree du developement du papillon Ephestia kuehniella. [77] 117: 33-36. **Weber, H.**—Zur kenntnis der doppelaugen der Aleurodinen. [34] 108: 49-58, ill.

ARACHNIDA AND MYRIOPODA.—Chamberlin, J. C.—On two species of false scorpions collected by birds in Montana, with notes on the genus Dinocheirus (Chelonethida). [55] 10: 125-132, ill. (*). **Jacot, A. P.**—Two species of lichen-mining mossmites [7] 27: 462-467, ill. (*). **Meise, W.**—Scorpiones [of Galapagos Isl.]. [Med. Zool. Mus. Oslo] 74, 25-43, ill. (*). **Milzer, A.**—On the great abundance of the black widow spider. [68] 80: 403. **Verhoeff, K. W.**—Bronns Klassen u. Ordningen des Tierreichs. Bd. 5, Abt. 2, p. 121-200. Symphyla u. Pauropoda.

THE SMALLER ORDERS OF INSECTS.—Esben-Peterson, P.—Neuropterous insects from Galapagos Isl. [Med. Zool. Mus. Oslo] 74: 291-294, ill. (*). **Lloyd, L. C.**—Two species of Mecoptera from Alaska. [55] 10: 119-120, ill. (*). **Mickel, C. E.**—The significance of the dragonfly name "Odonata". [7] 27: 411-414. **Navas, R. P. L.**—Insectos de Méjico. [Bol. Soc. Ent. España] 16: 68-75. (*). **Neave, F. A.**—A contribution to the aquatic insect fauna of Lake Winnipeg. [Intern. Rev. Gesam. Hydrob. u. Hydrog.] 31: 157-170, ill. (*). **Smith, R. C.**—Notes on the Neuroptera and Mecoptera of Kansas, with keys for the identification of species. [103] 7: 120-145, ill. **Ward, J. W.**—Boopinae Mallophaga collected from Oklahoma City dogs. [Proc. Okla. Ac. Sci.] 1933: 22-23, ill.

ORTHOPTERA.—Ander, K.—Ueber die gattung Cylindracheta und ihre systematische stellung (Saltatoria). [83] 26A, No. 21: 1-16, ill. **Hebard, M.**—Orthoptera of the Galapagos Islands. [Med. Zool. Mus. Oslo] 74: 279-280.

HEMIPTERA.—Barber, H. G.—Hemiptera-Heteroptera of the Galapagos Islands. [Med. Zool. Mus. Oslo] 74: 281-289. (*). **Bruner, S. C.**—Notas sobre Criptostenmatidos Cubanos. [Mem. Soc. Cuba Hist. Nat.] 8: 209-212, ill. (*). **China & Meyers.**—Critical notes on some neotropical species of Tomaspis (Cercopidae). [75] 14: 448-466. (*). **Oman, P. W.**—The Agallian leafhoppers of the Biologia material. [7] 27: 445-461, ill. **de la Torre-Bueno, J. R.**—A note on Nova Scotia Heteroptera. [4] 66: 201-202.

LEPIDOPTERA.—Clark, A. H.—Observations on the butterflies of Apple Orchard Mountain, Bedford County, Virginia. [Pro. Biol. Soc. Wash.] 47: 177-179. **Fenton, F. A.**—Tingitoidea affecting cotton. [4] 66: 198-199. **Hemming, F.**—Supplementary note on the dates of the plates of the Papiliones in Jacob Hübner's Sammlung Europäischer Schmetterlinge. [9] 67: 226-227. **Higgins, L. G.**—A note on the dates of Hübner's plates. [9] 67: 224-226. **Hoffmann, F.**—Beiträge zur naturgeschichte brasilianischer schmetterlinge. [45] 27: 22-29. **McDunnough, J.**—On Forbes' grouping of Agrotine genera. [4] 66: 202-203. **Sheldon, W. G.**—The genus Prepona. [9] 67: 228-230. **Warnecke, G.**—Einige schmetterlinge mit unsymmetrischen flügelhälften. [14] 48: 97-98, ill.

DIPTERA.—Edwards, F. W.—On the genus Comptosia and its allies. (Bombyliidae). [59] B, 7: 81-112. **Hendel, F.**—Uebersicht ueber die gattungen der Pyrgotiden, nebst beschreibung neuer gattungen u. arten. [59] B, 7: 141-156, ill. (No new Amer.) **James, M. T.**—Hoplitimyia, a new genus of Stratiomyidae. [7] 27: 443-444. **Parent, O.**—

Especes nouvelles de Dipteres Dolichopodides. [59] B, 7: 113-140, ill. (S). **Townsend, C. H. T.**—Manual of Myiology. Part 1. Development and structure. 275 pp., ill. **Wade, J. S.**—An annotated bibliography of the hessian fly Phytophaga destructor. [U. S. D. A., Mis. Pub.] 198: 100 pp.

COLEOPTERA.—Bierig, A.—Generos y especies nuevas de Estafilinidos Cubanos. [Mem. Soc. Cuba Hist. Nat.] 8: 213-223, ill. **Blaisdell, F. E.**—Note regarding the secondary sexual characters in Phloeodes [55] 10: 110. Note concerning Apsena barbarae. (Tenebrionidae). [55] 10: 110. **Cartwright, O. L.**—A new Ataenius from Florida (Scarabaeidae). [4] 66: 200-201. **Darlington, P. J.**—The subspecies of Chlaenius leucoscelis (Carabidae) with a note on a function of museums. [55] 10: 115-118. **Knull, J. N.**—New Coleoptera (Buprestidae and Cerambycidae). [43] 34: 333-336. **Linsley, E. G.**—Notes and descriptions of some Cerambycidae from the Tres Marias Islands. [55] 10: 107-110. (*). **Mank, E. W.**—New species of Orobanus. [55] 10: 121-124, ill. **Mansour, K.**—On the phylogenetic classification of the Coleoptera. [Bull. Soc. R. Ent. Egypte] 1933: 190-203, ill. **Nunenmacher, F. W.**—Studies among the Coccinellidae, No. 7. [55] 10: 113-114. **Parker & Smith.**—Further notes on Eoxenos laboulbenei with a description of the male. [7] 27: 468-479, ill. **Swaine, J. M.**—Three new species of Scolytidae. [4] 66: 204-206.

HYMENOPTERA.—Allen, H. W.—Descriptions of twelve new species of Tiphiidae from the United States with taxonomic notes. [1] 60: 295-316. **Cole, A. C.**—An ecological study of the ants of the southern desert shrub region of the United States. [7] 27: 388-405. **Doner, M. H.**—Observations on the biology of Microbracon pygmaeus, an important parasite of Coleophora pruniella. [7] 27: 435-442. **Malaise and Benson.** The Linnean Types of sawflies. [83] 26 A, No. 20: 1-14. **Smith, M. R.**—Three new North American ants. [7] 27: 384-387, ill. **Talbot, M.**—Distribution of ant species in the Chicago region with reference to ecological factors and physiological toleration. [Ecology] 15: 416-439. **Wheeler, W. M.**—Ants from the islands off the west coast of Lower California and Mexico. [55] 10: 132-144. (*).

SPECIAL NOTICES.—The Macrolepidoptera of the World. Fauna palaearctica Supplement. Parts 51-52. Vol. 3, pp. 121-160, pl. 13. Noctuiidae, by M. Draudt. These pages treat of the genus, Neoborelia of the Hadeninae, those of the Cucullianae, and Pyrois to Oligia of the Amphipyrinae. Publisher, Alfred Kernen Verlag, Stuttgart.

OBITUARY.

Dr. FRANCIS METCALF ROOT, associate professor of medical entomology in the School of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Maryland, died in the Hospital of the University, October 21, 1934. His death was attributed to heart disease. He was born at Oberlin, Ohio, September 24, 1889, and attended Oberlin College, where he received the A.B. in 1911 and the A.M. in 1912. Johns Hopkins gave him the Ph.D. in 1917, and here he continued as teaching fellow in the School of Hygiene, 1919-20, and associate, 1920-26, and was appointed associate professor in the last-named year. Early in his connection with this school, he began his work on the anopheline and other mosquitoes for which he is best known. In his spare time he turned his attention to the Odonata and contributed two papers on them to the NEWS: *Notes on Zygoptera from Maryland, with a description of Enallagma pallidum n. sp.* (Vol. xxxiv, pp. 200-204, July, 1923) and *Notes on Dragonflies from Lee County, Georgia, with a Description of Enallagma dubium, new species* (Vol. xxxv, pp. 317-324, Nov., 1924). Previously he had published an annotated list of *Dragon Flies Collected at Point Pelee and Pelee Island, Ontario, in the Summers of 1910 and 1911* (Canad. Ent. 44: 208-209, 1912), including notes on swarms of these insects in August of those two years.

He was the author of the section on Arthropods of Medical Importance in the well-known textbook, *Outlines of Medical Zoology* (New York, Macmillan, 1923), by Profs. R. W. Hegner, W. W. Cort and himself, all of Johns Hopkins, and of the section Medical Entomology in the larger *Animal Parasitology* (New York, the Century Co., 1929) by Prof. Hegner, himself and Prof. D. L. Augustine of Harvard.

Among his publications on the mosquitoes are:

1922. Larvae of American Anopheles. 2:379-393.
1922. Mosquitoes and other Blood-sucking Flies from Porto Rico. 2:394-405.
1923. Male genitalia of some American Anopheles. 3:265-279.
1923. Preferential Feeding Experiments with Anopheles. 3:354-355.

1924. Mosquitoes of Lee County, Georgia. 4:449-455.
1924. Further notes on the male genitalia of American Anopheles. 4:456-465.
1924. The larval pilotaxy of Anopheles quadrimaculatus and Anopheles punctipennis. 4:710-724.
1926-7. Studies on Brazilian mosquitoes. I. The Anophelines of the Nyssorhynchus group. 6:684-717. II. Chagasia fajardoi. 7:470-480. III. The genus Culex. 7:574-598. IV. Notes on some Brazilian species of Anopheles. 7:599-605.
1927. Note on the mosquito fauna of the Republic of Haiti. 7:463-469.
1932. The pleural hairs of American Anopheline larvae. 15:777-784.

All of the preceding publications are in the American Journal of Hygiene, in the volumes indicated.

1924. American Anopheline mosquitoes, Classification and Relation to Transmission of Malaria. Proc. Intern. Conf. Health Probs. Trop. Amer. 5:149-156. United Fruit Company, Boston.

The studies on Brazilian mosquitoes present results obtained during a trip to Brazil, extending from January 15 to July 8, 1925, undertaken upon the invitation and at the expense of the International Health Board of the Rockefeller Foundation.

He was also the author of *Experiments on the carriage of Intestinal Protozoa of man by flies* (Amer. J. Hyg. 1: 131-153, 1921) and of *Larval characters in the genus Sarcophaga* (Jour. Parasit. 9: 227-229, 1923).

A former student says of him: He was a quiet, scholarly gentleman, always considerate of his students and associates; his lectures were masterpieces, illustrated with beautiful drawings.

P. P. CALVERT.

Announcement of the death of Dr. FREDERIC W. GODING on May 5, 1933, was made in the NEWS for July of that year, page 196. A brief biographical sketch of him by Chris E. Olsen appears in the Journal of the New York Entomological Society for December, 1934 (issued two weeks earlier than its date). Mr. Olsen has added a bibliography of Dr. Goding's entomological papers. The following is omitted from his list: Synonymical Notes on Membracidae, ENT. NEWS xliv: 185-187, July, 1933.

ENTOMOLOGICAL NEWS

VOLUME XLV, 1934

HARRISON GRAY DYAR,
1866-1929.

PHILIP P. CALVERT, PH. D., EDITOR

ASSOCIATE EDITORS:

E. T. CRESSON, JR. R. G. SCHMIEDER, PH. D.

ADVISORY COMMITTEE:

PHILIP LAURENT
CHARLES LIEBECK
J. CHESTER BRADLEY, PH. D.
FRANK MORTON JONES, SC. D.
J. A. G. REHN
JOHN C. LUTZ
MAX KISLIUK, JR.
WM. W. CHAPMAN

PUBLISHED BY
THE AMERICAN ENTOMOLOGICAL SOCIETY,
PHILADELPHIA, PA.:
THE ACADEMY OF NATURAL SCIENCES
LOGAN SQUARE
1934

The several numbers of the NEWS for 1934 were mailed at the Post Office at Philadelphia, Pa., as follows:

No. 1—January .....January 18, 1934
" 2—February.....February 13
" 3—March .....March 9
" 4—April.....April 10
" 5—May ....May 7
" 6—June .....June 11
" 7—July ....July 25
" 8—October .....October 3
" 9—November..... .....November 9

The date of mailing the December, 1933, number will be announced on the last page of the issue for January, 1935.

INDEX TO VOLUME XLV.

(* indicates new genera, species, names, etc.)

AARON, E. M. Sex of migrating Danaus archippus..... 133
ABBOTT, C. E. Notes on the behavior of Creophilus villosus 91
ALDRICH, J. M. Revista de Entomologia..... 51
Types of Insects in the United States National Museum 8
ANONYMOUS: Cresson's Synopsis of the Hymenoptera... 102
ANONYMOUS: Applied Entomology in Public Health.... 267
BALL, E. D. The spittle insects of the genus Aphrophora occurring in the United States..... 175
BATES, M. Notes on some tropical Florida butterflies.... 166
Review: A systematic study of Trypetidae in the Japanese Empire 26
BELL, E. L., et al. On the stabilizing of four generic names (Rhopalocera) 160
BERRY, L. M. Larva of Nathalis iole 252
BIRD, R. D. The emergence and nymph of Gomphus militaris 44
BLAISDELL, F. E. Studies in the genus Corticeus..... 187
BOYER, D. A., and HEINZE, A. A. The copperhead as a destroyer of cicadas 88
BRADLEY, J. C. Records of Ampulicidae..... 32
The status of the genus Rhinopsis, with description of a new species from Texas 273
BRIMLEY, C. S. New species of wasps from North Carolina 41
BRITTON, W. E.—A tropical moth in Connecticut..... 43
BROWER, A. E. Collecting Catocalae (Noctuidae)..... 155
BROWN, C. Notes on Basilarchia lorquini form fridayi... 205
BYERS, C. F. Records of Florida dragonflies..... 214
CALVERT, P. P. Editorial: Entomology at the Convocation Week Meetings 47
Obituary: William Beutenmüller..... 112
Obituary: William Morris Davis 84
Obituary: Francis Metcalf Root 285

Obituary: Howard Austin Snyder 140
Obituary: Henry Frederick Wickham..... 83
Obituary: Robert Henry Wolcott 112
Review: The problems of insect study..... 110
Review: Entomology with special reference to its ecological aspects 227
Review: A general textbook of Entomology..... 230
CARTWRIGHT, O. L. A list of Scarabaeidae collected at Clemson College, South Carolina 237, 268
COCKERELL, T. D. A. October bee-collecting in Colorado. 29
Pyrameis cardui on New Year's Day..... 174
Thecla siva 51
COLE, A. C., JR. An extraordinary mound of the occident ant, Pogonomyrmex occidentalis 170
Pogonomyrmex occidentalis at Taos, New Mexico..... 169
Studies of semidesert ants 96, 113
CRESSON, E. T., JR. A note on the disposition of type material 216
Notes on a New Manual of North American Diptera, comments and criticisms 259
Notice: Ward's Entomological Bulletin..... 83
A reminder 217
Terminology of Types 122
Two new species of the genus Hydrellia from Mount Desert, Maine 234
Obituary: John Merton Aldrich 202
CRESSON, E. T., JR. (See Mackey, Laura S., and Cresson, E. T., JR.)
CROSBY, C. R. (See Zorsch & Crosby.)
DOELLO-JURADO, M. Obituary: Angel Gallardo..... 258
EMERY, R. G. Another case of Odonate Migration..... 50
ESSIG, E. O. Obituary: William Sherman Wright..... 27
FALL, H. C. A new Buprestid beetle from the Florida Keys 193
FELT, E. P. A new gall midge on fig..... 131
FERRIS, G. F. A summary of the sucking lice.....70, 85
FOLSOM, J. W. Review: A monograph of the Collembola of Iowa 227

FROST, S. W. A new species related to Agromyza virens. 40
FUNKHOUSER, W. D. A new membracid collected by Charles Darwin 203
GAHAN, A. B. Description of a new species of Eurytoma 116
GAMBLE, J. T. An observation on the activity of Laccophilus maculosus 49
GLAZBROOK, H. Capture of a species of Colaenis new to the United States 251
GREY, L. P. Lepidoptera from a Maine Bog..... 35
HEBARD, M. Notes on Orthoptera from northwestern Minnesota 103
The importance of considering the season of appearance in collecting species of Orthoptera 179
The sexes of Harroweria gloriosa 13
HEINZE, A. A. (See Boyer, D. A., and Heinze, A. A.)
HILTON, W. A. A new species of Pauropus from Iowa.. 67
HINMAN, E. H. Corethrella appendiculata from Louisiana 185
HINTON, H. E. A new name for Aphodium smithi..... 277
New species of Terapus from North America..... 270
HUGHES, G. F. Two chalcid parasites of the goldenrod gall-fly, Eurosta solidaginis 119
ISELY, F. B. Field notes on Texas Orthoptera..... 5
JACOT, A. P. Zur systematik der Oribatiden nach Willmann (May, 1930) 74
KITE, V. A calendar of Ozark butterflies, Lake Taneycomo Region, Missouri 36
KNULL, J. N. Five new species of Coleoptera..... 9
Notes on Coleoptera, No. 4..... 207
Two new Arizona Coleoptera 68
LINSLEY, E. G. Notes and descriptions of West American Cerambycidae 161, 181
LUDWIG, D. The progression factor in the growth of the Japanese beetle (Popillia japonica) (Scarabaeidae).... 141
MCATEE, W. L. On protective adaptations..... 57
MACKEY, LAURA S., and CRESSON, E. T., JR. Entomological literature.25, 52, 77, 107, 134, 170, 196, 218, 253, 281
NEEDHAM, J. G. Change of name 50

NICOLAY, A. S. An answer to E. Graywood Smyth on "Synopsis of Cicindelidae" 127
O'BYRNE, H. Strymon ontario in Missouri..... 212
Vespula germanica attacks a living Eacles imperialis... 101
PATE, V. S. L. The Nearctic species of Nitela, with a description of a new species of Solierella..... 241
PAYNE, N. M. An abnormal butterfly collected in the field 93
PIERCE, W. D. At what point does insect attack become damage? 1
REINHARD, H. J. Two new species of the tachinid genus Siphosturmiopsis with key and notes 15
ROBINSON, M. Pelecinus polyturator male..... 20
RODECK, H. G. Osmia permorata the female of O. abnormis 66
ROGERS, W. P. Collecting notes on Oeneis katahdin..... 191
SCHMIEDER, R. G. Review: Jungle bees and wasps of Barro Colorado Island. (With notes on other insects.) 139
SHANNON, R. C. Obituary: Nelson C. Davis..... 56
SHERMAN, J. D. Review: Bibliography of Australian Entomology 1775-1930, with biographical notes on authors and collectors 25
SIMMONS, S. W. A simple valve for controlling liquid flow under hydrostatic pressure, through rubber tubing.. 94
SMITH, M. R. Dates on which the immature or mature sexual phases of ants have been observed.....247, 264
STUTZMAN, J. W. Some observations on Notonecta undulata and other Aquatic insects in winter..... 278
SWEADNER, W. R. "Species" through hybridization?.... 231
TOWNSEND, C. H. T. Two new generic names..... 213
A new genus of Cobboldiini and a new genus of Chrysomyine flies 277
New name of Cypselopteryx 20
VAN DYKE, E. C. New species of Buprestidae with notes concerning others 61, 89
ZORSCH, H. M., and CROSBY, C. R. A new species of Eperigone 245

GENERAL SUBJECTS

American Association for the Advancement of Science and Associated Societies 47
Animals attacked by insects. 91, 101
Aquatic insects 278
Control of Pests 207
Controlling liquid flow..... 94
"Convocation Week" meetings 47
Entomological Literature, 20, 52, 77, 107, 134, 170, 196, 218, 253, 281.
Food of animals 88
Genera Insectorum 236
Hosts, Animal 91
Hosts, Insects 243, 277
Hosts, Plant, 2, 13, 20, 41, 51, 119, 131, 165, 177, 185, 189, 207, 233, 234, 243, 252, 280.
Insect attack becomes damage 1
Insects attacked by insects, 91, 101, 207, 271.
Orientation, Technique of..... 190
Osborn Collection 8
Parasites, Insect 119, 207
Plants attacked by insects, 1, 119, 207.
Protective adaptations 57
Public Health, Applied Entomology in 267
Revista de Entomologia..... 51
Types of Insects..... 8
Types, Terminology of..... 122
Ward's Entomological Bulletin 83

OBITUARY NOTICES

Aldrich, J. M. 202
Beutenmüller, W. 112
Carr, F. S. 202
Davis, N. C. 56
Davis, W. M. 84
Gallardo, A. 258
Root, F. M. 285
Snyder, H. A. 140
Van Duzee, M. C. 202
Wickham, H. F. 83
Wolcott, R. H. 112
Wormsbacher, H. 202
Wright, W. S. 27

PERSONALS

Goding, F. W. 286
Knull, J. N. 8
Osborn, H. 8

REVIEWS

Folsom and Wardle: Entomology with special reference to its ecological aspects..... 227
Imms: A general textbook of Entomology 230
Knight: The problems of insect study 110
Mills: A monograph of the Collembola of Iowa..... 227
Rau: Jungle bees and wasps of Barro Colorado Island..... 139
Shiraki: A systematic study of Trypetidae in the Japanese Empire 26
Musgrave: Bibliography of Australian Entomology 1775-1930, with biographical notes on authors and collectors.... 25

GEOGRAPHICAL DISTRIBUTION

Alabama: Hym. 249.
Arizona: Col. 11, 12, 63, 69, 161, 162, 183; Hem. 177; Hym. 170, 244; Orth. 179.
California: Col. 10, 15, 62, 89, 162, 181, 188; Dipt. 18, 41; Hem. 177; Lep. 205.
Colorado: Hem. 177; Hym. 29, 66; Lep. 51, 174, 205, 232.
Connecticut: Hym. 33; Lep. 43.
Florida: Col. 193; Dipt. 131; Hem. 176; Hym. 34, 242; Lep. 133, 166, 214.

Georgia: Hym. 33, 34, 242.
Idaho: Hym. 96, 113; Lep. 231.
Iowa: Arach. 67.
Kansas: Hem. 176.
Louisiana: Arach. 246; Dipt. 185; Hym. 249.
Maine: Dipt. 235; Lepid. 35, 191, 232.
Maryland: Hem. 177.
Michigan: Hem. 179; Lep. 231.
Minnesota: Hem. 177; Lep. 93; Orth. 103.
Missouri: Hym. 33; Lep. 36, 101, 212.
Montana: Hem. 177; Lep. 231.
Nebraska: Hem. 176.
Nevada: Lep. 205.
New Jersey: Hym. 242.
New Mexico: Col. 9, 13; Dipt. 18; Hem. 178; Hym. 169.
New York: Col. 119; Dipt. 41, 119; Hem. 178; Hym. 33, 118, 119, 242; Lep. 121.
North Carolina: Hym. 42.
North Dakota: Hem. 176.
Ohio: Hem. 177.
Oklahoma: Odon. 44.
Pennsylvania: Col. 49, 207; Hem. 178; Hym. 20, 33, 34; Lep. 231; Odon. 50.
South Carolina: Col. 237, 268.
South Carolina, Clemson College Scarabaeidae 237, 268
South Dakota: Hem. 176.
Tennessee: Hem. 176.
Texas: Col. 63, 165, 167, 185; Dipt. 16; Hym. 276; Lep. 251; Orth. 5.
Utah: Hem. 177; Lep. 231.
Virginia: Hym. 33, 34, 242.
Washington: Hem. 177; Lep. 206, 233.
West Virginia: Hem. 177.
Wisconsin: Hem. 177.
Africa: Hym. 33.
Canada: Hem. 176; Hym. 34; Lep. 206, 231.
Central America: Dipt. 186; Hym. 33; Orth. 13.
East Indies: Dipt. 20; Hym. 33.
Europe: Col. 3.
Mexico: Col. 270; Dipt. 16; Lep. 234.
Philippines: Col. 2; Hym. 33.
South America: Hym. 33.
Straits Settlement: Lep. 4.
West Indies: Dipt. 186; Hym. 33; Lep. 166.

COLEOPTERA

Acmaeodera (see *acuta, nigrovittata, vanduzeei, varipilis*)
acuminata, Strangalia 210
acuta, Acmaeodera 62
Adelocera (see *marmorata*)
Aegoschema (see *decipens*)
aerolatus, Elater 208
Agrilus (see *arizonus, audax, defectus, felix, parapubescens*)
Airora (see *cylindrica*)
albidus, Leptostylus 183
Allandrus (see *bifasciatus*)
alternatum, Dorcaschema..... 210
amoena, Cicindela 129
Anchastus (see *digitatus*)
Anobiidae 209
Anoplium (see *Elaphidion*)
Anoplodera (see *minnesotana, mutabilis*)
Anthaxia (see *quercata*)
Anthoboscus (see *ruricola*)
Anthonomus (see *pomorum*)
Aphodium (see *browni, smithi*)
Aphodium smithi, New name for 277
Aphodius (see *socialis*)
Aplagiognathus (see *remotus*)
Aporataxia (see *lineata*)
*arizonus**, *Agrilus* 11
Astylopsis (see *macula*)
Athous (see *cucullatus, pallidipennis, paradisus*)
audax, Agrilus 208

auguralis, Cicindela 129
auripilis, Tetropium 162
axillaris, Chrysobothris..... 66
axillaris, Purpuricenus..... 210
balloui, Terapus* 270
basicornis, Psyrassa 165
bicolor, Cymatodera 207
bifasciatus, Allandrus 211
blandus, Phymatodes 181
boharti, Chrysobothris*..... 89
Bostrichidae 209
Brachys (see *rufescens*)
brevicornis, Psyrassa* 164
browni, Aphodium* 277
Buprestis (see *rufipes*)
Buprestidae 11, 61, 68, 89, 208
Buprestidae, New species of, 61, 89
californica, Dicerca 91
californica, Oeme* 162
Callidium (see *hirtellum*)
Carabidae 207
Cerambycidae.....12, 68, 161, 209
Cerambycidae, Notes and descriptions of 181
chameleonis, Paratyndaris..... 195
chapuisi, Chramesus 211
chapuisi, Stephanoderus 212
Chramesus (see *chapuisi*)
Chrysobothris (see *axillaris, boharti, cupreohumeralis, sexsignata*)
Cicindela (see *amocna, auguralis, cimarrona, cyanocephala, decemnotata, denverensis, limbalis, purpurea, sedalia, splendida, transversa*)
Cicindelidae 127
cimarrona, Cicindela..... 129
Cleridae 9, 207
Clytus (see *marginicollis*)
Coccinellidae 209
coerulea, Encyclops..... 210
Coleoptera, Notes on..... 207
collaris, Leptostylus 211
concolor, Phymatodes*..... 181
corrugatus, Crypturgus 211
corrupta, Epilachna 209
Corticeus (see *occidentalis, parallelus, strublei, subopacus, substriatus*)
Corticeus, Studies in the genus 187
coursetiae, Paratyndaris..... 195
Creophilus (see *villosus*)
Creophilus villosus, Notes on behavior 91
cribratus, Stephanopachys..... 209
Cryptorhynchus (see *parochus*)
Crypturgus (see *corrugatus*)
cucullatus, Athous 208
cupreohumeralis, Chrysobothris* 65
curtipennis, Isohydnocera 121
cyanipennis, Gaurotes 209
cyanocephala, Cicindela 130
*Cylindrataxia** 183
see also *salicicola*)
cylindrica, Airora 209
Cymatodera (see *bicolor, neomexicana*)
Cyrtophorus (see *verrucosus*)
Curculionidae 211
decemnotata, Cicindela..... 129
decipens, Aegoschema..... 210
defectus, Agrilus 207
Dendroctonus (see *frontalis*)
densicolle, Paranoplium..... 164
denverensis, Cincindela.....129
Dicerca (see *californica, mutica, prolongata, sexualis, tenebrica*)
digitatus, Anchastus 208
Dinoderes (see *minutus*)
Dorcaschema (see *alternatum*)
Dytiscidae 49
Dytiscus (see *semisulcatus*)
Elaphidion (see *hoferi, magnipunctata*)
Elateridae 9, 10, 208
Elater (see *aerolatus, sanguinipennis*)

emarginata, Leptura 210
Encyclops (see *coerulea*)
Enoclerus (see *liljebladi*)
Epilachna (see *corrupta*)
exempta, Laphygma 3
falli, Leptostylus 182
felix, Agrilus 12
fitchi, Xyleborus 212
frontalis, Dendroctonus 207
gazellula, Microclytus 210
Gaurotes (see *cyanipennis*)
geminatus, Tilloclytus 210
georgiae, Stephanoderus 212
gracilis, Oeme 164
hirtellum, Callidium 181
Histeridae 270
hoferi, Elaphidion* 69
Hypermallus (see *villosus*)
infernalis, Terapus 272
Isohydnocera (see *curtipennis*)
Japanese beetle, Progressive factor in growth 141
japonica, Popillia 141
Laccophilus (see *maculosus*)
Laccophilus maculosus, Activity of 49
Laphygma (see *exempta*)
lateralis, Leiopus 211
laticollis, Oeme* 163
laurentina, Vrilletta 209
Leiopus (see *lateralis*) ..
Leptostylus (see *albidus, collaris, falli*)
Leptura (see *emarginata, lineola*)
Lepturges (see *symmetricus*)
Lepturoides (see *productus*)
liljebladi, Enoclerus 207
limbalis, Cicindela 129
Limonius (see *ovatus*)
lineata, Aporataxia 185
lineola, Leptura 209
lobigenis, Stenodontes 162
macula, Astylopsis 211
maculosus, Laccophilus 49
magnipunctata, Elaphidion ... 12
mali, Monarthrum 212
Mallodon (see *Stenodontes*)
marginicollis, Clytus 210
marmorata, Adelocera 208
masticator, Stenodontes 161
Mecas (see *vitticollis*)
mexicanus, Terapus 271
Microclytus (see *gazellula*)
mimus, Mylabris 211
minnesotana, Anoplodera..... 210
minutus, Dinoderes 209
mniszechi, Terapus 272
molitor, Tenebrio 144
Monarthrum (see *mali*)
Mordellistena (see *unicolor*)
mutabilis, Anoplodera 210
mutica, Dicerca 91
Mylabridae 211
Mylabris (see *mimus*)
neomexicana, Cymatodera*... 9
nigritus, Terapus* 271
nigrovittata, Acmaeodera* ... 61
Nothopleurus (see *Stenodontes*)
occidentalis, Corticeus 191
Oeme (see *californica, gracilis, laticollis*)
olneyae, Paratyndaris 195
Ostomidae 209
ovatus, Limonius* 9
pallidipennis, Athous 10
paradisus, Athous* 10
parallelus, Corticeus 190
Paranoplium (see *densicolle*)
parapubescens, Agrilus* 68
Paratyndaris (see *chameleonis, coursetiae, olneyae, suturalis*)
parochus, Cryptorhynchus.... 211
penicellatus, Pogonocherus.... 211
Phymatodes (see *blandus, concolor, picipes, propinquus, testaceus*)
picipes, Phymatodes* 165, 181
Pityophthorus (see *puberulus, pulicharius*)
planata, Tyndaris 195

Platystomidae 211
Ploeoptervus (see *thoracicus*)
Pogonocherus (see *penicellatus*)
pomorum, Anthonomus 3
Popillia (see *japonica*)
productus, Lepturoides 208
prolongata, Dicerca 90
propinquus, Phymatodes*..... 181
Psyrassa (see *basicornis, brevicornis, sallaei*)
puberulus, Pityophthorus..... 212
pulicharius, Pityopthorus..... 212
purpurea, Cicindela 128
Purpuricenus (see *axillaris*)
quadrimaculatus, Xylotrechus. 210
quercata, Anthaxia 208
remotus, Aplagiognathus* 161
rufescens, Brachys 209
rufipes, Buprestis 208
rugulosus, Scolytus 211
ruricola, Anthoboscus 210
salicicola, Cylindrataxia*..... 184
sallaei, Psyrassa 165
sanguinipennis, Elater 208
Scaphinotus (see *viduus*)
Scarabaeidae 141, 277
Scarabaeidae of Clemson College 237, 268
Scolytidae 211
Scolytus (see *rugulosus*)
sedalia, Cicindela 130
semisulcatus, Dytiscus 151
sexsignata, Chrysobothris..... 208
sexualis, Dicerca 91
smithi, Aphodium 277
socialis, Aphodius 277
splendida, Cicindela 129
Staphylinidae 91
Stenodontes (see *lobigenis, masticator*)
Stephanoderus (see *chapuisi, georgiae*)
Stephanopachys (see *cribratus*)
Strangalia (see *acuminata*)
strangulatus, Trochorhopalus. 3
strublei, Corticeus* 188
subopacus, Corticeus 190
substriatus, Corticeus 190
suturalis, Paratyndaris* 193
symmetricus, Lepturges 211
tenebrica, Dicerca 90
Tenebrio (see *molitor*)
Tenebrionidae 187
Terapus (see *balloui, infernalis, mexicanus, mniszechi, nigritus*)
Terapus, New species of..... 270
testaceus, Phymatodes..... 210
Tetropium (see *auripilis*)
Thanasimus (see *trifasciatus*)
thoracicus, Ploeoptervus..... 207
Tilloclytus (see *geminatus*)
transversa, Cicindela..... ... 130
trifasciatus, Thanasimus..... 207
Trochorhopalus (see *strangulatus*)
Tyndaris (see *planata*)
unicolor, Mordellistena..... 119
vanduzeei, Acmaeodera* 64
varipilis, Acmaeodera*..... 62
verrucosus, Cyrtophorus..... 210
viduus, Scaphinotus..... 207
villosus, Creophilus..... 91
villosus, Hypermallus 209
vitticollis, Mecas 211
Vrilletta (see *laurentina*)
Xyleborus (see *fitchi*)
Xylotrechus (see *quadrimaculatus*)

HEMIPTERA

angulata, Aphrophora 177
annulata, Aphrophora 178
Aphrophora (see *angulata, annulata, canadensis, irrorata, parallela, permutata, princeps, quadrinotata, salicis, saratogensis, signoreti*)
Buenoa (see *margaritacea*)
canadensis, Aphrophora 178

Cercopidae 175
chloromera, Tibicen 88
Cimex (see *lectularius*)
darwini, Orekthen* 203
irrorata, Aphrophora 177
lectularius, Cimex 143
Magicicada (see *septendecim*)
margaritacea, Buenoa 280
Membracidae 203
Notonecta undulata, Observations on 278
Notonectidae 278
Orekthen (see *darwini, osborni*)
osborni, Orekthen 204
parallela, Aphrophora 177
permutata, Aphrophora 177
princeps, Aphrophora 177
quadrinotata, Aphrophora 177
salicis, Aphrophora 175
saratogensis, Aphrophora 178
septendecim, Magicicada 88
signoreti, Aphrophora 177
Tibicen (see *chloromera*)

HYMENOPTERA

abbottii, Rhinopsis 32
abnormis, Osmia 66
adara, Ageniella* 41
Ageniella (see *adara, aludra, julia, subra*)
aludra, Ageniella 42
Ampulex (see *caniculatus*)
Ampulicidae 32, 273
Ampulex (see *compressa, dubia, erythropus, fasciata, ferruginea, laevigata, maculicornis, neotropica, pennsylvanicus, pilipes, sagax, surinamensis, trigonopsis*)
Ant communities 99, 113
Ants, Immature or mature sexual phases 247, 264
Ants, Dissemination of..... 115
Ants, Seasonal successions.... 96
Ants, Semidesert 96, 113
Bee-collecting in Colorado.... 29
caniculatus, Rhinopsis, Ampulex 32, 273
Chalcidoidea 116
compressa, Ampulex 276
corniculus, Dolichurus 33
Crematogaster (see *lineola*)
Dolichurus (see *corniculus, greenei*)
dubia, Ampulex 33
Eciton (see *mexicanum, pilosus*)
erythropus, Ampulex 33
Eurytoma (see *gigantea, obtusiventris*)
Exylaeus (see *Halictus*)..... 29
fasciata, Ampulex 273
ferruginea, Ampulex, Rhinopsis* 274
floridana, Nitela* 241
Formicidae.....96, 113, 169, 170
germanica, Vespula 101
gigantea, Eurytoma 116, 119
gomelza, Priocnemis* 43
greenei, Dolichurus 33
grindeliae, Halictus* 29
Halictus (see *grindeliae*)
Immature phases of ants, 247, 264
julia, Ageniella* 42
laevigata, Ampulex 33
Leptothorax (see *rugatulus*)
lineola, Crematogaster 243
Lissonata (see *marginata*)
maculicornis, Ampulex 273
marginata, Lissonata 121
melanognatha, Rhinopsis 32
Melissodes (see *octobris*)
mexicanum, Eciton 247
mirificus, Solierella, Silaon*.. 243
neotropica, Ampulex 33
Nitela (see *floridana, virginiensis*)
obtusiventris*, Eurytoma..117, 120
occidentalis, Pogonomyrmex, 114,

169, 170
*octobris**, *Melissodes* 30
Osmia (see *abnormis, permorata*)
Pelecinidae 20
Pelecinus (see *polyturator*)
pennsylvanicus, Ampulex 32
permorata, Osmia 66
pilipes, Ampulex 33
pilosus, Eciton . 247
Pogonomyrmex (see *occidentalis*)
polyturator, Pelecinus 20
Priocnemis (see *gomelza*)
Psammocharidae 41
Rhinopsis (see *abbottii, caniculatus, ferruginea, melanognatha*)
Rhinopsis, Status of..... 273
rugatulus, Leptothorax 116
sagax, Ampulex 33
Solierella (see *mirificus*)
Sphecidae 241
*subra**, *Ageniella* 42
surinamensis, Ampulex 33
Synopsis of Hymenoptera, Cresson's 102
Tetrastichus (see *thanasimi*)
thanasimi, Tetrastichus 207
trigonopsis, Ampulex 273
Vespidae 101
Vespula (see *germanica*)
virginiensis, Nitela 242
Wasps from North Carolina.. 41
Winter mortality of Pogonomyrmex 114

DIPTERA

*advenae**, *Hydrellia* 236
Agromyzidae 40
Agromyza (see *angelicae, virens*)
albimanus, Anopheles 186
albisquama, Alitophasia, Litophasia 213
*Alitophasia** 213
(see also *albisquama*)
*angelicae**, *Agromyza* 40
Anopheles (see *albimanus, gambiae*)
Anthomyiidae 20
appendiculata, Corethrella 185
*birdi**, *Ficiomyia* 132
Cobboldia (see *loxodontis*)
Cobboldiini, New genus of.... 277
Corethrella (see *appendiculata*)
cruralis, Hydrellia 234
Culicidae 185
*Cypselopteryx** 20
(see also *mima*)
Dexiidae 213
Drosophila (see *melanogaster*)
Ephydridae 235
Eurosta (see *solidaginis*)
Ficiomyia (see *birdi*)
gambiae, Anopheles 186
Itonididae 131
Hydrellia (see *advenae, cruralis, proctori, scapularis, serena*)
Litophasia (see *albisquama*)
loxodontis, Platycobboldia, Coboldia 277
Lucilia (see *rufifacies*)
Manual of Myiology..... 14
Manual of North American Diptera 259
melampyga, Siphosturmiopsis. 16
melanogaster, Drosophila..... 142
*mima**, *Cypselopteryx* 20
Musca (see *putoria*)
oestracea, Rohdendorfia, Tachina 213
Oestridae 277
*oteroensis**, *Siphosturmiopsis*. 16
phyciodis, Siphosturmiopsis ... 19
*Platycobboldia** 277
(see also *loxodontis*)
*proctori**, *Hydrellia* 235
putoria, Pycnosomops, Musca. 277

*Pycnosomops** 277
(see also *putoria*)
rafaeli, Siphosturmiopsis..... 16
*Rohdendorfia** 213
(see also *oestracea*)
rufifacies, Lucilia 277
*rufiventris**, *Siphosturmiopsis*. 18
scapularis, Hydrellia 234
serena, Hydrella 236
Siphosturmiopsis (see *melampyga, oteroensis, phyciodis, rafaeli, rufiventris*)
Siphosturmiopsis, Two new species with key and notes.. 15
solidaginis, Eurosta.....116, 119
Tachina (see *oestracea*)
Tachinidae 213
Trypetidae 119
virens, Agromyza 40

LEPIDOPTERA

Abnormal butterfly 93
angulifera, Callosamia 231
Appias (*see ilaire, poeyi*)
archippus, Danaus 133
aristodemus, Papilio 167
Basilarchia (see *burrisonii, eavesii, fridayi, lorquini, nevadae, weidemeyerii*)
berenice, Danaida 168
biselliella, Tineola 144
Bog Lepidoptera 35
burrisonii, Basilarchia 206
Callosamia (see *angulifera*)
cardui, Pyrameis 174
carteri, Colaenis 169
Catocalae, Collecting 155
cecropia, Platysamia 231
cillene, Colaenis 169
Citheroniidae 101
clymena, Diaethria 166
Colaenis (see *carteri, cillene, julia, nudeola, phaetusa*)
columbia, Platysamia 232
Danaidae 133
Danaida (see *berenice, eresimus, kaempfferi*)
Danaus (see *archippus*)
devilliersi, Papilio 166
Diaethria (see *clymena*)
Eacles (see *imperialis*)
eavesii, Basilarchia 205
eresimus, Danaida 168
euryalis, Platysamia 231
Eurema (see *messalina*)
fridayi, Basilarchia 205
gloveri, Samia 231
Hybridization, "Species" through 231
ilaire, Appias 167
imperialis, Eacles 101
iole, Nathalis 252
julia, Colaenis 169
kaempfferi, Danais 168
kasloensis, Platysamia 231
katahdin, Oeneis 191
levisella, Trichotaphe 121
lorquini, Basilarchia 205
lucayus, Papilio 166
Lycaenidae 51, 212
Melete (see *salacia*)
messalina, Eurema 168
Metamorpho (see *stelenes*)
Migrating Danaus, Sex of.... 133
Nathalis (see *iole*)
Nathalis iole, Larva of..... 252
nevadae, Basilarchia 205
Noctuidae 155
nokomis, Platysamia 231
nudeola, Colaenis 168
Nymphalidae 174, 205, 251
Oeneis (see *katahdin*)
ontario, Strymon 212
Ozark Butterflies 36
Papilio (see *aristodemus, devilliersi, lucayus, polydamas, ponceana, temenes*)
phaetusa, Colaenis 251
Pieris (see *protodice*)
Pieridae 93, 252

Platysamia (see *cecropia, columbia, euryalis, kasloensis, nokomis*)
Pseudosphinx (see *tetrio*)
poeyi, Appias 167
polydamas, Papilio 166
ponceana, Papilio 167
protodice, Pieris 93
Pyrameis (see *cardui*)
rufivena, Tirathaba 4
salacia, Melete 167
Samia (see *Platysamia*)
Samia (see *gloveri*)
Saturniidae 231
Satyridae 191
siva, Thecla 51
Sphingidae 43
Stabilizing of generic names.. 160
stelenes, Metamorpha 166
Strymon (see *ontario*)
temenes, Papilio 167
tetrio, Pseudosphinx 43
Thecla (see *siva*)
Tinecla (see *biselliella*)
Tirathaba (see *rufivena*)
Trichotaphe (see *levisella*)
Tropical moth in Connecticut 43
weidemeyerii, Basilarchia 205

ODONATA

Aeshnidae 50
Agrionidae 50
Anax (see *junius, longipes*)
balteata, Macrodiplax 215
bella, Nannothemis 143
Dragonflies, Florida 214
Emergence of Gomphus..... 44
georgina, Macromia 215
Gomphinae 44
Gomphus (see *militaris*)
junius, Anax 50
laurenti, Enallagma 215
linearis, Somatochlora 215
longipes, Anax 215
Macromia (see *georgina*)
Migration of *Anax junius*.... 50
militaris, Gomphus 44
Nannothemis (see *bella*)
obscurus, Progomphus 215
Progomphus (see *obscurus*)
Rima 50
*Rimanella** 50
salva, Telebasis 215
Somatochlora (see *linearis*)

ORTHOPTERA

Acrydium (see *angustum, ornatum*)
Ageneotettix (see *deorum*)
angustum, Acrydium 103
apicialis, Tridactylus 106
aridifola, Tenodera 143
Arphia (see *pseudonietana*)
bioculata, Sphodromantis 141
bivittatus, Melanoplus 105
bolli, Spharagemon 105
borealis, Melanoplus 105
Camnula (see *pellucida*)
Ceuthophilus (see *maculatus*)
Chloealtis (see *conspersa*)
Chorthippus (see *curtipennis*)
Chortophaga (see *viridifasciata*)
collare, Spharagemon 105
Conocephalus (see *saltans*)
conspersa, Chloealtis 104
costalis, Encoptolophus 104
curtipennis, Chorthippus 104
dawsoni, Melanoplus 105
deorum, Ageneotettix 104
differentialis, Melanoplus 144
Dixippus (see *morosus*)
Encoptolophus (see *costalis*)
femur-nigrum, Melanoplus.... 179
furcata, Scudderia 106
gladstoni, Melanoplus 105
gloriosa, Harroweria 13
Harroweria (see *gloriosa*)
Hesperotettix (see *pratensis*)
infantilis, Melanoplus 105
kiowa, Trachyrhachis 105
lateralis, Tettigidea 103
luridus, Melanoplus 106

maculatus, Ceuthophilus 106
Melanoplus (see *bivittatus, borealis, dawsoni, differentialis, femur-nigrum, gladstoni, infantilis, luridus*)
minutus, Tridactylus 106
morosus, Dixippus 142
nigricornis, Oecanthus 106
Notes on Texas Orthoptera.. 5
Oecanthus (see *nigricornis*)
ornatum, Acrydium 103
Orphulella (see *pelidna, speciosa*)
Season of appearance in collecting 179
pelidna, Orphulella 104
pellucida, Camnula 104
pratensis, Hesperotettix 105
pseudonietana, Arphia 104
saltans, Conocephalus 106
Scudderia (see *furcata*)
speciosa, Orphulella 104
Spharagemon (see *bolli, collare*)
Sphodromantis (see *bioculata*)
Tenodera (see *aridifolia*)
Tettigoniidae 13
Tettigidea (see *lateralis*)
Trachyrhachis (see *kiowa*)
Tridactylus (see *apicialis, minutus*)
viridifasciata, Chortophaga.... 104

ANOPLURA

Anoplura, Summary of....70, 85
humanus, Pediculus 87
lobatus, Pediculus 87
mjöbergi, Pediculus 87
Pediculus (see *humanus, lobatus, mjobergi, schaeffi*)
schäffi, Pediculus 87

ARACHNIDA, ETC.

Acarus (see *coleoptratus, geniculatus*)
*albula**, *Eperigone* 245
berlesei, Sphaerozetes 75
coleoptratus, Acarus 76
Eperigone (see *albula*)
ephippiatus, Zetes 75
fuscipes, Oribates 75
geniculatus, Acarus 74
Hoplophora (see *laevigata*)
laevigata, Hoplophora 74
*medianus**, *Pauropus* 67
morticinus, Zetes 75
Murcia (see *trimaculata*)
orbicularis, Oribates 74
Oribates (see *fuscipes, orbicularis, setosus*)
Pauropus (see *medianus*)
Pauropus, New species..... 67
setosus, Oribates 75
Sphaerozetes (see *berlesei*)
Oribatiden, Systematik der... 74
trimaculata, Murcia 75
Zetes (see *ephippiatus, morticinus*)

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Exchange—Pachysphinx modesta. Progeny of modesta imperator (female) and normal male to exchange for Erinnys or other southern Sphingids. Heodes dorcas and others offered for Florida Theclas or Hesperiidae. Perfect specimens only. H. M. Bower, 1302 Davis Street, Evanston, Illinois.

Exchange—Will collect insects of Connecticut this season and desire to get in touch with collectors desiring this material, either in exchange or for cash. Harry L. Johnson, So. Meriden, Conn.

Wanted—Names and addresses of those desiring Cocoons of Actias luna and Automeris io. Exchange considered. Eggs in season. Virginia Weaver, 822 S. College Ave., Tulsa, Okla.

Literature Wanted—Barnes & McDunnough's "Contributions," Henry Edward's "Pacific Coast Lepidoptera" and other publications relative to North American Lepidoptera. C. F. dos Passos, Mendham, New Jersey.

SUBSCRIPTION BLANK

Enclosed find payment for my subscription to ENTOMOLOGICAL NEWS for one year, beginning with issue for .....

Name .....

Address .....

Post Office .....

The subscription price per year of ten (10) numbers:

United States, Central and South America, $3.00
Canada, - - - - - - - - 3.15
Foreign, - - - - - - - - 3.25

Payments are acceptable in United States currency and Postal Money Order, by Check on Domestic (United States) bank, Foreign draft on New York, and by International Postal Order.

Address ENTOMOLOGICAL NEWS,
1900 RACE STREET, PHILADELPHIA, PA., U. S. A.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

These prices to DOMESTIC PURCHASERS only.

Quotations to foreign purchasers will be given on application and are subject to differences in Foreign Exchange rates.

COLEOPTERA

989.—**Blaisdell** (F. E.).—Studies in the genus Auchmobius. Tenebrionidae. (Trans., **60**, 223-264, 3 pls., 1934) .... .80

DIPTERA

987.—**Huckett** (H. C.).—A revision of the North American species belonging to the genus Coenosia (Muscidae). II. The subgenus Limosia. (Trans., **60**, 133-198, 6 pls., 1934) 1.25

988.—**Cresson** (E. T.).—Descriptions of new genera and species of the dipterous family Ephydridae. XI. (Trans., **60**, 199-222, 1934) ..... .50

LEPIDOPTERA

990.—**Williams & Bell.**—Studies in the American Hesperioidea. IV. (Trans., **60**, 265-280, 1 pl. 1934) ..... .30

ORTHOPTERA

991.—**Hebard** (N.).—Studies in Orthoptera which occur in N. America, north of the Mexican boundary. IV-V. (Trans., **60**, 281-293, 1 pl., 1934) ..... .30

M-8.—**Rehn & Rehn.**—The Eumastacinae of southern Mexico and Central America (Orthoptera: Acrididae). (Mem. 8, 84 pp., 6 pls., 1934)..... 2.50

Herewith find remittance for $....., for which please send me the items checked above.

Write your name and address in the space below.

UNPARALLELED! **UNIQUE!**

Indispensable to every College, Entomological Library, Museum and Private Collector

The Macrolepidoptera of the World

By Dr. A. SEITZ, Professor,

in collaboration with well-known specialists from America, England, Germany and France. (English, French and German Editions.)

THE ONLY EXISTING WORK WHICH CONTAINS ALL LEPIDOPTERA FROM AMERICA LIFE-LIKE TO NATURE BY MEANS OF MULTI-COLORED CHROMOLITHOGRAPHY.

Double Vol. V.—The American Butterflies (complete), 1150 pages of describing text and more than 9000 illustrations on 203 plates in half-calf $96.00

Double Vol. VI.—The American Bombycides and Sphingides (almost complete), 1080 pages of text and 161 multi-colored plates unbound $87.00

Double Vol. VII.—The American Noctuidae, 384 pages of text and 42 multi-colored plates $28.50
(to be completed with about 700 pages and 68 plates)

Double Volume VIII.—The American Geometridae, 72 pages of text and 8 multi-colored plates. $8.00

The purchase can also take place by some numbers monthly. Besides there have appeared in the same excellent execution

The Palaearctic Fauna, in Double Volumes 1–4
The Indo-Australian Fauna, in Double Volumes 9–12.
The African Fauna, in Double Volumes 13–16.

IT IS REALLY A PLEASURE TO DETERMINE EVERY BUTTERFLY OR MOTH BY THIS IMPORTANT WORK.

SEITZ-WORK is being judged by collectors as follows:

"This work is truly a blessing to all those who are interested in Lepidoptera especially in moths of the whole world, as there is no useful book of reference in existence." G....., New York

ZOOLOGICAL OBS: My urgent appeal to every entomologist to purchase this fundamental and absolutely necessary work ought not to be left unheeded; it is the most copious, best, most beautiful, and nevertheless cheapest manual on Lepidoptera in the world, and will be and remain for many years a most reliable book of reference concerning the most difficult groups.

Prospectus with all particulars through

ALFRED KERNEN, Publisher

STUTTGART W, SCHLOSS-STRASSE 80, GERMANY.

WARD'S INSECT STORAGE EQUIPMENT

SCHMITT BOXES.—Ward's makes the only genuine Schmitt Box. Furnished with pinning bottom of patent entomological cork or balsa wood.

Price per dozen with Patent Cork $38.00
Price per dozen with Balsa Wood $35 00

THE NEW WARD INSECT BOX.—An inexpensive pest-proof container. Beveled pest-proofing flange protects insect specimens from damage. Composition pinning bottom will not corrode pins.

Price per dozen. $22.20

THE WARD ECONOMY BOX.—An all wood box with composition bottom. For student use or storing of series of duplicates.

Price per dozen. Lined with white glazed paper. . . $11.20
Price per dozen. Unlined. $10.00

INSECT CABINET DRAWERS.—Ward's can supply either the Cornell University or the United States National Museum Type for $4.00 and $5.00 each.

UNIT PINNING TRAYS.—Trays for the above cabinet drawers are in stock at all times.

Ward's Natural Science Establishment, Inc.

P. O. Box 24, Beechwood Station
ROCHESTER, N. Y., U. S. A.

FINE INDIAN BUTTERFLIES,

named in papers, 100, about 50 species, $6.00. 200 ditto, about 100 species, $12.00. About 200 species of named Indian Lycaenidae at cheap rates. Thousands of Morphos from French Guiana, etc., at cheap rates per dozen or 100.

British Lepidoptera and Coleoptera, named. Many important works on Enropean Lepidoptera, etc. Particulars from

A. FORD, CZ., ENTOMOLOGIST
42, IRVING ROAD, BOURNEMOUTH, ENGLAND

For Sale Butterflies and Moths native to southern tip of Florida. Special: bred specimens of Citheronia sepulchralis at $5.00; Automeris lilith at 50 cents.

MRS. LESLEY E. FORSYTH,
Florida City, **Florida.**